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Reclaim Lost Capacity In Your Data Center

It Starts With An Approach That Combines The Best Of Engineering, IT

A FUNNY THING HAPPENED to data centers during the past 30 years. They evolved more quickly than the practices now being used to manage them. That, says Sherman Ikemoto, Future Facilities general manager, North America, is because the data center management processes presently in use evolved from general building management practices. They needed to have evolved from electronics cooling engineering practices. As such, management challenges now exist that the industry wasn't prepared for; challenges "probably best described as protecting the facility's ability to safely house IT equipment—to protect the compute capacity of the room," Ikemoto says.

Despite enterprises being aware they need to fully utilize the expensive facilities they've built, current techniques for addressing capacity issues lack a desperately needed engineering component, Ikemoto says.

The Fundamental Problem

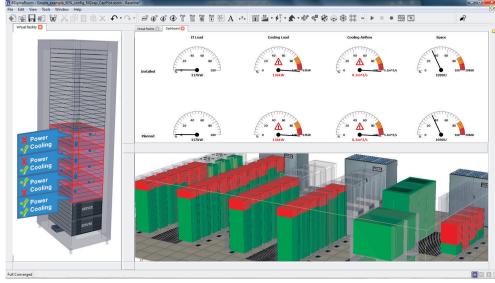
Current practices often lead to losses of more than 30% of the original Design Compute Capacity in modern mission-critical facilities. In fact, it is safe to say that owner/operators will lose a minimum of 30% of capex from day one.

Why hasn't anyone highlighted such a shocking state of affairs? Because these losses are due to fragmentation of space, power, and cooling over time and do not become obvious until well into the operational life of the facility.

Fragmentation occurs because a typical owner/operator will almost certainly break the original IT load layout planned during the design of the facility. One example is that a facility manager will often assume a 3kW load of blade technology in a cabinet will have the same engineering impact as 3kW of standard server hardware. But while the power draw in both cases is the same, the airflow requirements will be substantially different, leading to cooling imbalances and fragmentation.

Owner/operators are intuitively aware of these losses and have been asking for solutions. It is common to see that large swaths of space not being utilized simply because the facilities manager is afraid of potential hot spots due to lack of available cooling.

Many believe that the main reason for such losses is because owner/operators are not effectively monitoring their assets, power, and environment. Because of this, the current market panacea is the use of modern DCIM tools. However, while accurate monitoring is good and an essential part of managing the facility, it will not help with the losses due to fragmentation.





Companies go these routes nonetheless, Ikemoto says, because "there isn't enough engineering expertise in the industry to champion a more effective approach.

A Better Future For Facilities

Future Facilities' approach differs from other DCIM solutions by integrating simulation capabilities using an approach called predictive DCIM. "Predictive DCIM is based on simulation techniques that view the engineering impact of any future IT load configuration prior to implementation, thus helping in reducing compute capacity losses and IT equipment resilience issues," Ikemoto says. If the model predicts that capacity will be destroyed, an engineering fix can be incorporated to avoid the damage that would have been done otherwise.

"Capacity is not a stationary thing. It changes with each change to the IT configuration," Ikemoto says. Ultimately, "you want to exhaust all your resources at the same time," something that's tricky "unless you can see how [space, power, and cooling] relate to each other and to the IT configuration."

Ikemoto likens the situation to a fragmented hard drive where the only way to reclaim space is via defragmentation. Beyond space, though, data center managers must also manage power and cooling together because "you may do a very good job of defragmenting your data center space, but all that defragmented space could be in a spot where

there's no cooling," Ikemoto says. "And if that's the case, you don't have capacity."

Enter 6SigmaFM

6SigmaFM from Future Facilities gives users a way to predict and visually show how data center changes will influence space, power, cooling, and ultimately capacity. "It's like being able to walk into your real data center and see space, power, and cooling availability and then identify why they have gone out of alignment and how to realign them so that capacity is always available where you need it," Ikemoto says.

Future Facilities uses CFD (computational fluid dynamics) analysis to simulate airflow and cooling. This is integrated with space and power simulation to reveal how cooling—the invisible aspect of capacity—is redistributed by the IT configuration relative to space and power. This destroys rows of capacity on the data center floor and capacity associated with individual u-slots inside of cabinets.

And 6SigmaFM and its related tools work for new data center builds as well as for ones that have been in operation for years, Ikemoto says, helping those data centers "establish a new roadmap where it not only upgrades and changes IT equipment as usual but integrates solutions to reclaim capacity as it goes."

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"Predictive DCIM is based on simulation techniques that view the engineering impact of any future IT load configuration prior to implementation, thus helping in reducing compute capacity losses."

- Future Facilities' Sherman Ikemoto

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Providing The Building Blocks For Embedded Computing

Supermicro Offers Extensive Product Portfolio, Industry Expertise

THE WORLD OF EMBEDDED COMPUTING is constantly evolving and adapting with

technology advancement. At its core, embedded computing is about application-specific component selection and optimal product life

cycle management. Designing with these key constraints in mind can help deliver the best price, performance, and margins for products.

Finding the best options for your product is like trying to hit multiple fast-moving targets. In a marketplace flooded with component and vendor choices with constantly evolving new technologies, designers face a challenging and tedious decision-making process. As a business, you need to select, sample, and certify components as well as qualify vendors and secure costeffective pricing based on projected volume, all while performance and technology continue to make advances. Simultaneously, you must ensure the parts and pieces of your solution will all have sustained availability, backward compatibility, and support over the life of your solution.

These factors combined add up to extended design cycles, which in turn lengthen the expectation and concern of product availability. Due to these complexities, industries such as industrial automation and control, medical and military, aerospace, or defense are evolving to a Commercial Off-The-Shelf (COTS) model of server product procurement to keep up with the fast-paced advancement in technology.

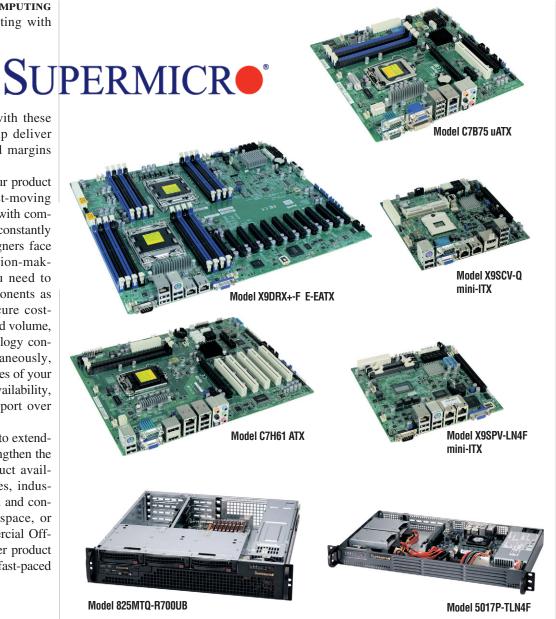
Supermicro's Approach

Supermicro focuses on application optimization, product quality, availability, and total customer satisfaction. The company is a leading innovator in highperformance, high-efficiency server technology and a premier provider of endto-end server solutions for enterprise IT, HPC, and cloud computing worldwide. Supermicro's server technology proficiency, highly reliable design philosophy, long product lifecycles, and cost competitiveness have all been integrated into its embedded products. With the company's extensive knowledge and expertise in high-end server design and manufacturing, Supermicro offers the embedded market a new partner that delivers the highest-quality products and solutions

SUPERMICRO EMBEDDED PRODUCTS

(408) 503-8000 www.supermicro.com/embedded

Embedded products and solutions can take advantage of Supermicro's expertise in highend server design, product life cycle management, COTS procurement model, and supplier relationships to ensure the fastest time-to-market and highest ROI in highly dynamic market conditions. Protect your investments and IP by partnering with Supermicro for your most challenging embedded needs.



that meet even the most challenging embedded design needs.

Time-To-Market & First-To-Market

Supermicro takes pride in its capability to deliver products that fit almost any requirement. The company also strives to innovate and deliver products with the fastest time-to-market (TTM) and in many cases first-to-market (FTM), as demonstrated by its innovative x86 server product line. Both TTM and FTM are critical factors to embedded solution lifecycles. If you have a specific application, chances are Supermicro already has a configuration available that fits your needs. If you have a custom embedded requirement, Supermicro employees have the engineering expertise and quality control to deliver a tailored solution with dedicated support and fast TTM.

Compliance & Qualification

Product qualification for safety, reliability, durability, or environmental factors has a direct impact on TTM. Lengthy qualification cycles, especially for Mil-Spec, FDA, and industrial applications, can take months or even years and are very costly in time, money, and resources. To make up for this, products must be available for a long period of time. An Engineering Change Order

(ECO) is also a sensitive issue for embedded products. Whenever there is a change in form, factor, or function, requalification and recertification will negatively impact TTM and cost vs. revenue models.

Supermicro has built strong relationships with top-tier component suppliers, over many years, to develop a highly regarded server solutions business. The company's well established suppliers have built reliability, availability, and serviceability (RAS) into their products as part of their standard design practice.

In addition, Supermicro has more than a decade of experience designing highly successful, high-end products that integrate a wide variety of technologies from its qualified component suppliers. The company has a proven track record of delivering qualified products to the OEM market, which requires higher sensitivity and carries additional restrictions pertaining to post-production revisions. Supermicro's lineup of standard and custom products meets compliance and qualification requirements for demanding embedded applications.

Economies Of Scale

To obtain the lowest-cost, highest-reliability solution in the embedded market, hardware should have the least amount

of components necessary and software should be highly optimized. However, there are other factors that affect the total cost of ownership (TCO) beyond development costs, such as the cost of keeping products on the shelf for an extended period of time and long-term maintenance and system support issues.

Supermicro purchasing agents are experts in procuring standard COTS components in high volume. The company leverages its strong server business and extensive vendor relationships to deliver excellent pricing on components of the highest quality and reliability, and it does the subsystem work for you upfront. Supermicro customers benefit from its low price points by using its qualified COTS components for their solutions, rather than having to research, reinvent, and redesign.

Extensive Product Portfolio

Supermicro provides the widest range of motherboards, chassis, and power supplies in the industry. The company's more than 550 motherboards, 1,300-plus chassis, 350-plus cooling modules, and more than 140 power supplies can easily fulfill any embedded solution requirements. Customers that need a simple bezel change, BIOS customization, or motherboard component change can more than likely find what they need using one of Supermicro's standard product offerings. Embedded customers can source embedded building block solutions from Supermicro and concentrate on designing the best embedded products for the markets they serve.

Future-Proof Roadmap

Supermicro understands that one of the major benefits of embedded computing is the ability to essentially future-proof your server and component purchases. That's why the company incorporates seamless transition plans into its products that provide forward and backward compatibility. Its embedded SKU offers not only seven year long life availability but typically provide a two- to three-year transition between generations. As a Supermicro partner, you'll receive the reliability, longevity, and flexibility you need as your business continues to grow.

Embedded Everywhere

Today, Supermicro products are deployed across many embedded applications. In medical equipment, high-end dual processor motherboards are building blocks for image processing in MRI scanners. Traffic signals are powered by ruggedized controllers that operate in a harsh environment that monitor traffic patterns to optimize traffic flow. Similarly, digital signage on freeways, airports, and sporting arenas is often powered by low power, small form factor motherboards. Next time when you are waiting at a traffic junction for the signal to turn green or at the airport reading a flight schedule monitor or when you see a doctor viewing a medical image at the hospital, most likely the embedded computing for these devices was provided by Supermicro.

Cooling That's Effective, Affordable & Energy-Saving

Evaporative Cooling Completely Eliminates Need For Compressor-Based Systems

ONE OF THE BIG NAMES in server manufacturing recently released a new generation of servers that will work very well under the new ASHRAE TC 9.9 guidelines for data center design and operation.

This new generation of servers can handle temperature extremes of up to 45 degrees Celsius, or 113 degrees Fahrenheit, for up to 90 hours per year. One of the rationales behind marketing the server at those conditions was to allow fresh air cooling in virtually the entire continental United States. Other research has indicated that the servers can

operate 87% of the year in Washington, D.C., using fresh air cooling alone.

Energy-Saving Potential

The energy-saving potential of raising the inlet temperatures that high can be enormous. Instead of running chillers or compressors 8,760 hours a year, they are only operating 1,138 hours per year.

It's difficult to put that into numbers, but here's a little example:

If the server power consumption is 300 watts, then the cooling system must

remove 300 watts times 8,760 hours per year or 2,628kWh of heat (8,961,480 BTU). That can be accomplished using mechanical cooling, fresh air cooling, or a combination of the two.

A pretty efficient compressorized HVAC

A pretty efficient compressorized HVAC system will remove about 4.5 watts of heat per watt of electrical energy used. So to cool the new server using mechanical cooling will require 2,628,000 watts of heat divided by 4.5, or 584kWh of compressor power.

To cool that same server using fresh air for 87% of the year will only require 75.8 kWh of compressor power. Of course, the fan energy stays the same in both cases, but the compressor savings of 508.2kWh per server can really start to add up.

At an aggressive electric rate of 4.5 cents per kWh, that amounts to \$22.87 per server per year. At modest densities of, say, 40 servers per rack, the savings amounts to \$915 per rack per year. Now consider how many racks are in the typical server room or data center. If the data center has a server load of 1mW, then a density of 40, 300-watt servers per rack will translate into 83 racks. So the annual savings would be almost \$76,000 in this example.

MESTEX AZTEC EVAPORATIVE COOLING SYSTEM

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Can be configured to provide indirect evaporative, indirect/direct evaporative, or evaporative cooling with DX (direct expansion) or ChW (chilled water) supplemental cooling.



Even Greater Savings

To make the savings even greater, you could use the Aztec ASC indirect evaporative cooling system. Using the Aztec system completely eliminates the compressor-based cooling, adding another \$3.50 per server per year of savings. That would add another \$11,620 per year in savings for a total annual savings of \$87,620 in this example.

Of course each climate and data center is different, and Aztec analyzes each case. But the reduction in operating costs are significant in every case that Aztec has studied.

Aztec and its sister company, Alton, have been in the evaporative cooling business for 66 years. Many of the evaporative cooling technologies that are just now being introduced to the market were developed more than 20 years ago by Aztec. Our experience, combined with our state-of-the-art controls, can assure you of the most efficient evaporative cooling solution available.



FEATURED COMPANY

Intelligent PDU Solutions From Industry Leaders

PDUs Direct & Server Technology Team To Provide Multiple Product Lines For Diverse Needs

You NEED GOOD, clean, consistent power for your data center, but how can you be sure that your valuable equipment is getting the power it needs? The only way is to employ reliable power distribution units to supply the power and to use appropriate monitoring units to ensure that the power you're getting is in fact clean, efficient, and consistent.

Of course, sometimes you or your customers need basic or metered PDUs that you can

set up and use quickly, with minimal complications. At other times, more complex problems call for more sophisticated solutions, and those can require more thought and more advanced units—and often more help acquiring and configuring those units. You need a PDU vendor you can trust, whether you're seeking a simple, economical power delivery solution or looking to equip a large data center with state-of-the art power distribution and monitoring.

Either way, PDUs Direct and Server Technology are there for you. Two companies selling the quality, reliable and trusted Server Technology products, PDUs Direct and Server Technology can work together to help you meet the power and monitoring needs of data centers large and small. Whether it's an enterprise-class multifacility data center or a tiny server closet, PDUs Direct and Server Technology have what you need. The two companies want to provide the best customer service and options, no matter how you choose to buy. And that's what PDUs Direct and Server Technology have accomplished.

Simple, Reliable PDUs, Shipped Quickly

For simple, fast, and affordable power distribution, turn to PDUs Direct (www.pdus-direct.com). As a longtime leader in low-cost, fast-shipping PDUs, PDUs Direct's expanded offering includes affordable basic and metered PDUs as well as select switched models. PDUs Direct has been selected as the Master Distributor for Server Technology on

select products and will utilize a distribution channel and reseller channel to deliver products to customers.

Whether it's a simple 20A server rack power strip with 12 NEMA 5-20R outlets or a rackmount 30A 208V power strip with 24 IEC C13 outlets, PDUs Direct has what you need. A selection of more than 80 basic metered and switched units, PDUs Direct has your customers' most straight forward power distribution needs covered nicely.

As an approved GSA reseller, PDUs Direct provides some of the lowest-cost power distribution units in the industry and ships them the day after the order is placed in most cases. When your needs—or your customers' needs—are clear-cut, turn to PDUs Direct for quick delivery of dependable, Basic Metered and Switched PDUs.

More Sophisticated Tools For More Complex Operations

Need more? More sophistication? More features? More help? Server Technology (www.servertech.com) is there to provide the premier models of the most sophisticated PDUs and monitoring solutions currently available. Server Technology's PDUs provide more intelligence, switched and smart PDUs, per-outlet monitoring, and more productivity—and Server Technology can provide all the expertise you need to help you install and configure your PDUs.

For a better handle on PUE, you need more sophisticated delivery and monitoring units, and Server Technology provides them in the form of POPS (Per Outlet Power Sensing) Switched PDUs such as the CWG-24V 3Ph PDU with 50/60Amp power distribution. Smart and Switched PDUs such as the CWG-24V can tell you if there's enough power available to add more devices or if you're close to exceeding the circuit's capacity. In addition, Server Technology's switched PDUs can control network access to remote sites and data center equipment via IP-based remote power management, and they can be configured to enable network access for remote power management to reboot servers and network gear individually or as a selected group.

Of course, complex technology requires sophisticated management. Server Technology's Sentry Power Manager is the most accurate system you can use to measure and monitor your power usage. It gives you the data you need to make critical decisions regarding your efficiency and carbon footprint, as well as temperature and humidity, at the rack level. Sentry Power Manager is the premium software solution for monitoring your network of sophisticated PDUs. Using SPM's Web-based interface, you can monitor and control your PDUs at the outlet level, view and print status logs, generate reports, and more, managing power distribution in a single data center, in centers across campus, or in locations around the world.

With Sentry Power Manager and Server Technology's sophisticated PDUs, you're in complete control of your complex power distribution needs.

PDUs DIRECT & SERVER TECHNOLOGY

www.pdusdirect.com www.servertech.com

- PDUs Direct specializes in power distribution units that are simple, efficient, and affordable for data centers with basic needs.
- Server Technology's PDUs and Sentry Power Manager software meet more sophisticated needs to provide and monitor power to missioncritical devices
- The companies work together to provide multiple product and service channels and exactly the resources that will provide the best value and customer service for all their customers.



Instant Search, New Features

dtSearch Version 7.70 Enhances Document Filters, Supporting A Range Of Data Types

DTSEARCH CORP. has taken its industry-leading enterprise and developer text retrieval to a new level with its Version 7.70. The release enhances dtSearch's proprietary document filters. These provide data parsing, conversion, and extraction in the dtSearch product line, and they are also available for separate licensing. The filters support Office documents, emails plus nested attachments, static and dynamic online data, and databases.

Instantly Search Terabytes Of Text

dtSearch products make it easy to instantly search terabytes of text, spanning directories, databases, online data, and emails. The products can index over a terabyte of text in a single index, and create an unlimited number of indexes and search them. Indexed search time is typically less than a second, even across terabytes of data. Online indexed searching operates in a "stateless" environment, supporting unlimited concurrent search threads.

Among the most important features of the dtSearch product line are its support for 25+ full-text and fielded data search types, including special forensics search options. In addition, dtSearch products offer federated or distributed searching with integrated relevancy ranking across any number of different data repositories.

Document Filters

dtSearch's proprietary document filters support a broad range of data types:

- Office documents: MS Office, OpenOffice, RTF, PDF, etc.
- Emails: MS Exchange, Outlook, Thunderbird, etc., all with nested attachments
- Compression formats: ZIP, RAR, GZIP/ TAR, etc.
 Web ready data: HTML, YML/YSL
- Web-ready data: HTML, XML/XSL, and PDF
- Dynamic data: PHP, ASP.NET, CMS, SharePoint, etc.
 Databases: SOL including BLOB data
- Databases: SQL including BLOB data (through the dtSearch Engine APIs), MS Access, XBASE, XML, CSV, etc.

The document filters support parsing of all of the above data types as well as text extraction and/or conversion to HTML as required for browser display with highlighted hits.

Embedded image enhancements. Version 7.70 extends the document filters to add image support to Word (.doc/.docx), PowerPoint (.ppt/.pptx), Excel, (.xls/.xlsx), Access (.mdb/accdb), RTF, and email files, including Thunderbird (mbox/.eml), and Outlook (.pst/.msg) files. The new version displays these formats with highlighted hits in context with both text and images.

Multi-level nested file enhancements.

The dtSearch document filters also support documents and images in multilevel nested configurations. For example, Version 7.70 supports not only viewing images in an email file, but also images in a PowerPoint embedded in a Word document attached as a zipped file to an email message. A new "object extraction" API lets developers navigate through the structure of each embedded object as a hierarchy, and optionally extract each object.

Other Features

Spider. The Spider works with local and remote, static and dynamic Web content. Hit-highlighted searching can span any level of site depth, across any number of public and private or secure sites, including support for log-ins and forms-based authentication. The Spider is built into the dtSearch product line and accessible through a .NET API for programmers.

Developer APIs. The dtSearch Engine SDKs include native 64-bit and 32-bit, Windows and Linux, C++, Java and .NET (through 4.x) APIs. For customers in need of data parsing, conversion, and extraction only, the document filters are available for separate OEM licensing. ■

dtSearch



Desktop with Spider

Network with Spider

Publish (portable media)

Web with Spider includes 64-bit versions

Engine for Win & .NET

Document Filters
also available for separate licensing

Instantly Search Terabytes of Text

(800) IT-FINDS (800/483-4637) www.dtsearch.com

Version 7.70 is an updated version of the entire dtSearch lineup for instantly searching terabytes of data. dtSearch's proprietary document filters support a wide range of data, including "Office" files, emails with nested attachments, static and dynamic Web data, and databases.

In addition to its enterprise products, dtSearch offers its instant searching and document filters for a range of Internet, intranet, and other commercial applications. The company's website showcases hundreds of developer case studies and press reviews. Fully-functional evaluations of all products are available.

FEATURED PRODUCT

A Comprehensive Metric For IT Energy Efficiency

Power Assure PAR⁴ Helps Uncover Hidden Capacity

Power Assure's PAR⁴ Technology does something every enterprise should find beneficial: provide accurate server energy consumption data that could lead to extending data center life. PAR⁴ does this by putting a tangible measurement and rating in managers' hands. They can use this measurement to unearth hidden capacity. Why bother? Because energy costs have never been higher and additional capacity is in high demand.

"Provisioning racks based on the vendor's nameplate power consumption figures leaves much-needed power untapped," says Power Assure CTO Clemens Pfeiffer. "By using actual power consumption data through PAR4, you can vastly increase your rack capacity, often doubling IT capacity."

Better Provisioning

Data center managers typically provision servers based on power consumption figures listed on nameplates or provided by vendors, "minus a small percentage, assuming

you never load anything up to more than 80%," Pfeiffer says. These figures are conservative, as they're based on fully populated equipment, so they're nearly always overstated, Pfeiffer says. The result is stranded power. Worse, calculating for higher power consumption means enterprises are apt to overcool data centers. Plus, Pfeiffer says, "data center operators think that they're running out of power,

even when the racks or rooms are half full."

Managers also typically provision servers using processing capacity that's expressed in transactions per second. These ratings are important, Pfeiffer says, but energy consumption can differ among equipment with similar performance characteristics and abilities. By selecting the most efficient servers, overall power cost declines and the enterprise saves money, he says.

To this end, Underwriters Laboratories published UL2640, a performance standard based on PAR⁴ testing methodology. UL2640 gives hardware vendors an easy, universal way to publish accurate power consumption figures by providing equipment makers the PAR⁴ testing regimen as part of certification. With PAR⁴ included, Pfeiffer says, the "UL certification provides a third-party vendor, independent standard for data center managers to assess their IT equipment for energy efficiency for accurate capacity planning, as well as for ongoing hardware refresh programs." Moreover, managers can use PAR⁴ as a repeatable, consistent measure that hardware vendors are unable to tweak.

Under The Hood

PAR⁴ measures servers under real-life load conditions to derive a measurement (the higher the number, the better the energy efficiency) and rating (Green, Gold, Silver, or Black; Green being best). Measurements are collected through a client with power meters and oscilloscopes to denote power consumption during test cycles. These include power on Spike, boot cycle, and a 100% load benchmark cycles that show power consumption during off, idle, loaded, and peak states of server utilization. The reason for measurements at four states, Pfeiffer says, includes:

- Off—To know how much power IT equipment uses when off but plugged in.
- Idle—To know the power consumption wasted on IT equipment running but not needed or used.
- Loaded—"This is the power you need to allocate for the equipment, as at any given time the load can go up, and that's the maximum to plan for during normal operation."
- Peak—Usually the same as Loaded; in some cases during boot cycle with all fans

engaged, power consumption could rise higher than during normal operation.

"Given Moore's Law, IT equipment performance doubles every two years," Pfeiffer says. To simplify server comparisons, a Moore's Law-based PAR⁴ rating labels comparative efficiency for each year, "past, present, and future," Pfeiffer says. This lets IT classify equipment based on "its energy efficiency relative to past and future equipment and in turn, they can then provision servers appropriately for compute needs today and plan accordingly into the future. They can also use it for an ROI on early refresh, virtualization, or hardware upgrades in general."

PAR⁴ Measurement Service

To help with PAR⁴ testing, Power Assure provides a PAR⁴ Measurement Service that gathers measurements on equipment, pinpointing exactly how much power a server uses. "This is measured data, not estimates," Pfeiffer says. "Power Assure technicians will perform all measurements at your location or our own laboratory using the Underwriters Laboratories tested PAR⁴ methodology and equipment (UL2640 standard)."

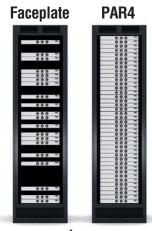
POWER ASSURE PAR4

tested by Underwriters Laboratories.

(888) 225-1575 www.powerassure.com

A comprehensive metric for IT energy efficiency





By using PAR⁴, this 10kW rack was able to go from having the power maxed out while only half full to being full and still having power left to spare.

A Bold New Line Of Servers & Storage

Aberdeen LLC Ups The Ante With 21 New Stirling & AberNAS Products

ABERDEEN STIRLING & **ABERNAS**

(800) 500-9526 www.aberdeeninc.com

Aberdeen upgraded 21 products in its line, adding new features such as support for PCI Express 3.0, in 1U to 8U form factors.

SERVER AND STORAGE MANUFACTURER

Aberdeen LLC once again stakes its claim to its position as a leading provider of the latest technologies to the IT community. Aimed at all IT users from the smallest businesses to multi-petabyte storage consumers, this newly released offering promises to deliver the most bang for the buck at every level.

IT and data center managers know you can only get the most out of servers and storage if they are ready for the upcoming technologies, which is why Aberdeen added PCI Express 3.0 support to its Stirling servers and AberNAS storage solutions. This means every new model will support the latest PCI-E 3.0 controllers with a bus that provides up to two times the bandwidth of the previous models. This will enable Aberdeen customers to benefit from the upcoming PCI-E 3.0 controllers such as RAID, HBA, Fibre storage, and multi-port 10Gb network controllers at their full speed by taking advantage of all of the



functionality provided by the newest Intel® Xeon® Processor E5-2600 series.

When it comes to storage solutions, it all starts with capacity. Aberdeen's product lineup offers a variety of options for customers. Aberdeen products come in 1U to 8U form factors with 4, 12, 16, 24, 36, 48, or 64 drive bays depending on the model. Every system supports enterprise-level hard drives up to 4TB per drive, delivering as much as 256TB of hard drive capacity in a single device.

The 21 new products that make up this release include seven new Windows NAS products featuring Windows Storage Server 2012, seven new Linux NAS products featuring Aberdeen's latest 64-bit Linux NAS operating system, and seven new servers running Windows Server 2012 or your choice of many popular flavors of Linux.

Remote monitoring and management is handled in a highly efficient manner by the Intelligent Platform Management Interface

SABERDEEN

is standard in all models. This functionality is further enhanced by including a dedicated, Out of Band, IPMI RJ45 LAN port, which

means the server's hardware can be monitored and managed without taking up a chunk of the storage array's bandwidth. This feature also lets users manage the system from a remote location, even if it's powered off, which means you can restart or power on the server or NAS while away from the data center.

With form factors ranging from a 1U 4-Bay up to an 8U 64-Bay, up to 256TB of storage, Intel® Xeon® Processor E5-2600 series, up to 512GB of memory, dual onboard 10Gb or 1Gb Ethernet ports, PCI-E 3.0, a dedicated IPMI port, JBOD Expansion Capabilities, and redundant hot-pluggable power supplies, Aberdeen's Stirling servers and AberNAS storage systems are clearly the right choice for the discerning IT user.

Feature Summary:

- · Windows NAS, Linux NAS, server and storage server environments
- 1U, 2U, 3U, 4U, 5U, 8U form factors • Up to 256TB of storage in a single unit

- (IPMI), which | 4, 12, 16, 24, 36, 48, or 64 hot swap drive bays
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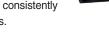
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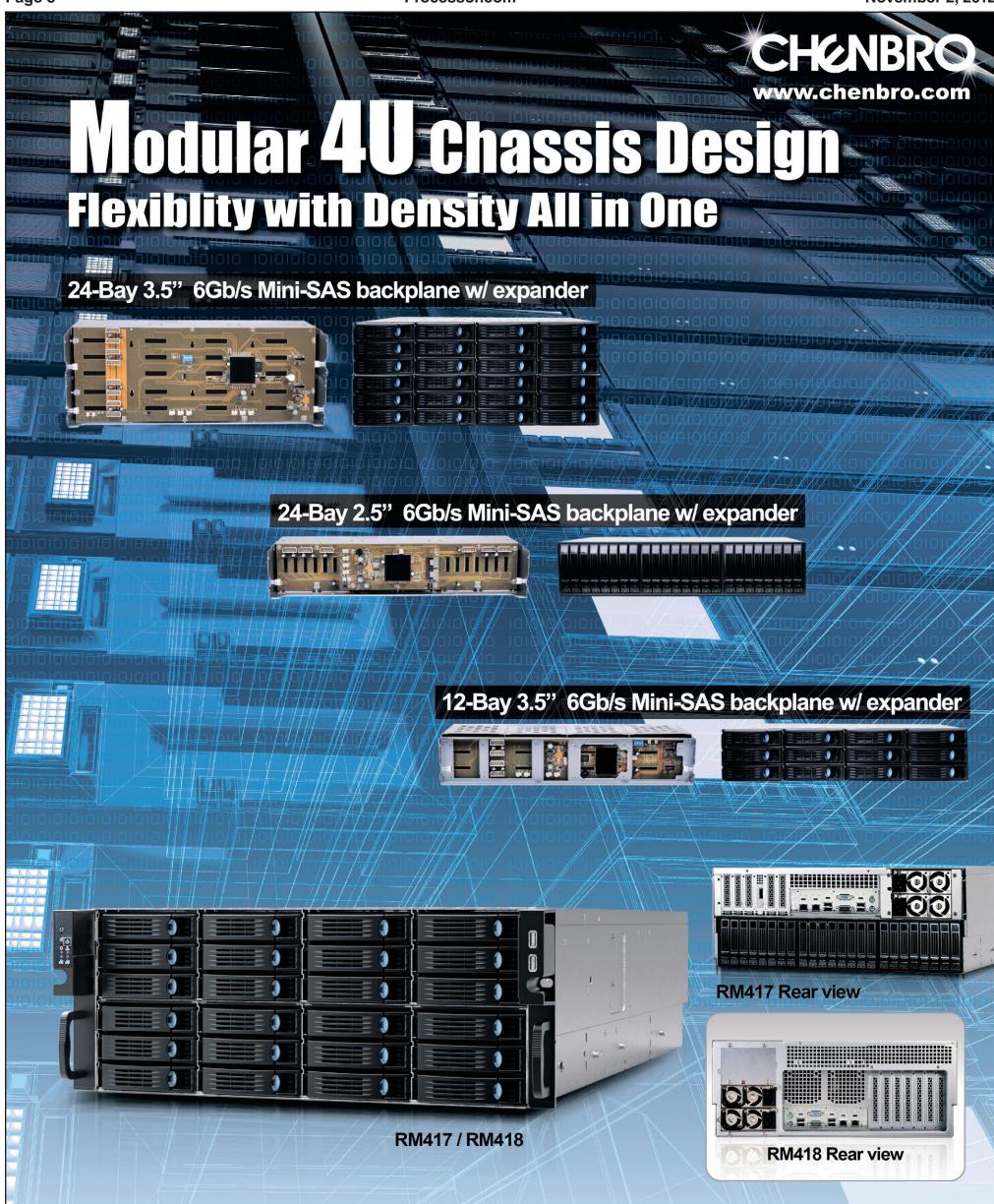
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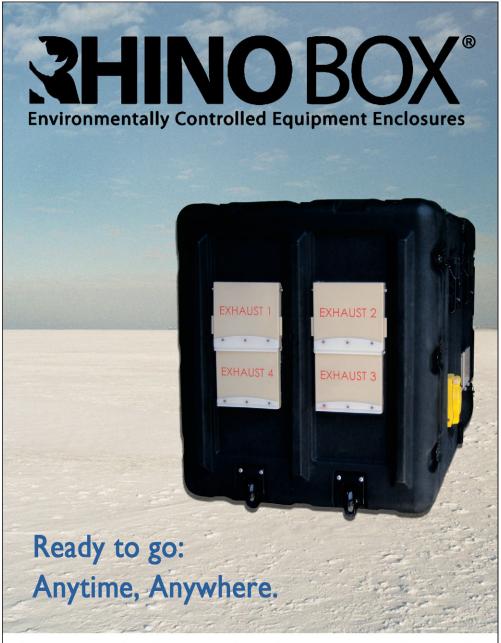
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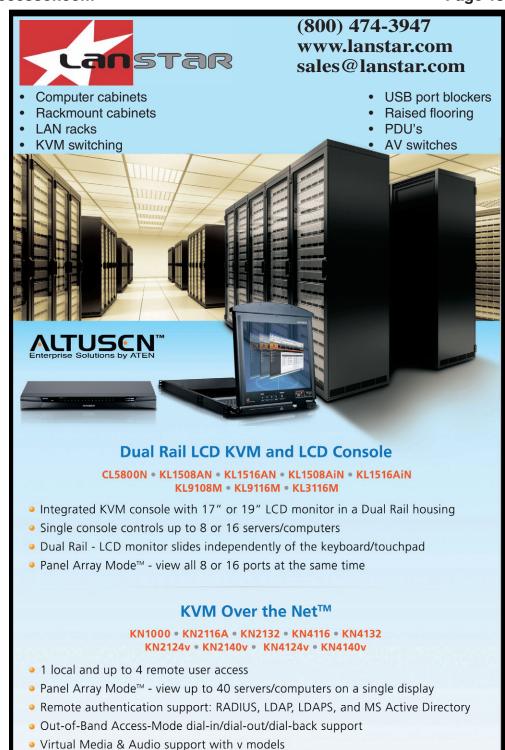
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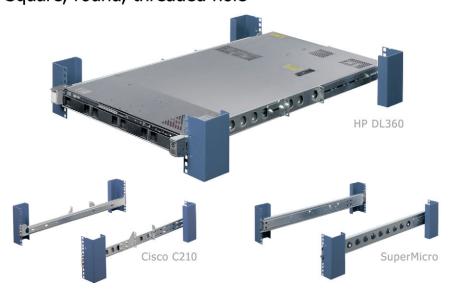




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Retail Colocation Vacancies Increasing

Telecom research company TeleGeography recently reported that vacancy rates for retail colocation sites have reversed direction and are now increasing. Among the cities covered in the report, Los Angeles was typical, with vacancy rates increasing from 19% in 2011 to 34% in 2012. These figures are derived from TeleGeography's Colocation Database, which tracks 2,581 colocation sites around the globe and relies on 909 site surveys for its 2012 market trend data. "Despite the increase in vacancies," says Jon Hjembo, analyst with TeleGeography, "demand for colocation services remains strong." He adds that "colocation sites built in the past two years are filling at a faster rate than comparable sites were last year."

Big Data Driving Big IT Spending

Far from being a market in and of itself, says research firm Gartner, big data solutions exist across many markets. Furthermore, last year "big data formed a new driver in almost every category of IT spending," says Mark Beyer, research vice president for Gartner. "By 2020," Beyer says, "big data features and functionality will be non-differentiating and routinely expected from traditional enterprise vendors and part of their product offerings." Indeed, big data spending is already on its way up, as Gartner forecasts worldwide IT spending on big data will amount to \$28 billion in 2012 and increase to \$34 billion in 2013.

Business DemandTo Spur Ultrabook Sales

In its new report, "Ultrabooks Market To 2016," GBI Research indicates that the relatively new Ultrabook market will experience a 69.2% CAGR from 2012 to 2016, with global sales reaching \$75.8 billion in 2016 com-

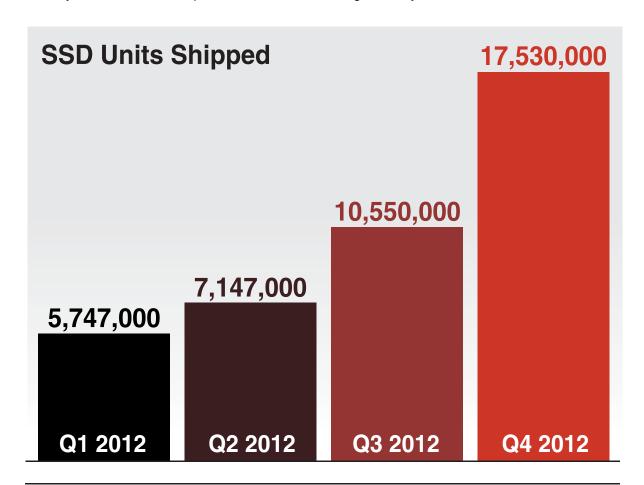
pared to \$1.3
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but GBI Research suggests that continued support from Intel (including financial support) combined with increased demand among business users (those seeking computers that combine lightweight, low-profile features with high performance) will significantly influence sales.

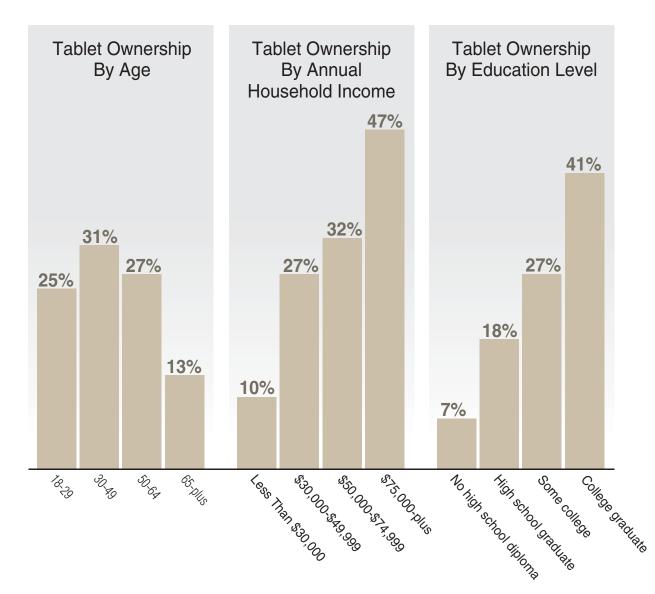
■ Growth Continues For SSD Shipments

According to research from the IHS iSuppli Memory & Storage Service, the inclusion of SSDs (solid-state drives) in newer notebooks and other mobile devices has bolstered SSD shipments despite notebook sales that have been lower than anticipated. Ryan Chien, IHS analyst for memory and storage, says IHS has lowered its SSD shipment projection. "However," he adds, "pricing for SSDs has fallen well below the \$1-pergigabyte threshold, making their value proposition more attractive than ever." Because SSDs are included in a variety of mobile devices, shipments have increased throughout this year, as this chart shows.



One Quarter Of American Adults Own Tablet Computers

New research from Pew Research Center's Internet & American Life Project shows that one quarter of adults in the United States own a tablet computer. The survey found minimal differences in ownership based on gender and race, but significant differences when it comes to age, household income, and education level.



Workstation Market Remains Sluggish

Shipments of workstations were down during the second quarter of this year, marking the first time the market has been down for two consecutive quarters since 2008, according to Jon Peddie Research. Alex Herrera, senior analyst at Jon Peddie Research, says the workstation market is being hit by the same issues as most other IT segments. "Like any other, this market will rise and fall with the tempo of the overarching economy," Herrera says. "With the economy stubborn to shake its lethargy, and with new IT form factors vying for users' eyeballs, all PC-related industries are having trouble making headway as of late." Herrera says there are reasons for optimism in the future, though, citing an increase in potential buyers and the fact that the workstation market is outpacing other PC-class devices. About 883,000 workstations were shipped during the second quarter, according to the research group, down 3.8% from the previous quarter and 2.6% from a year ago.

Security Spending Remains Strong

Enterprises don't appear to be cutting back on securityrelated spending, Gartner reports, in spite of continued pressure on IT budgets. In fact, Gartner expects that worldwide spending on security will be up 8.4% this year, to \$60 billion. By 2016, that number should reach \$86 billion. IT outsourcing (managed security services), secure Web gateway (appliance), and security information and event management (SIEM) are the three fastest-growing segments, according to Gartner. In the Gartner study, about 45% of respondents expect to increase their security budget this year, 50% expect it to stay the same, and 5% expect their budget to decrease.

Spending On Storage Software Is Relatively Flat

The second quarter saw mixed results when it comes to spending on storage software. The Worldwide Storage Software QView from IDC reports that revenue in the market was up a meager 0.9%. It's the second consecutive quarter of reduced year-over-year growth, IDC reports, and marks a performance level not seen since the fourth quarter of 2009. IDC notes that five of the top eight suppliers saw a growth in revenue, but that growth was offset by declines in revenue by some of the market's leading suppliers. Data protection and recovery and archiving software were the two fastest-growing segments.

■ FCC To Boost Mobile Spectrum

The Federal Communications Commission is on track to make 300MHz of new wireless spectrum available for commercial networks by 2015, according to a recent speech given by FCC Chairman Julius Genachowski, with 500MHz available by 2020. "To put the 300 and 500 MHz numbers in context," Genachowski said in the speech, "consider this: when we released the plan, 500MHz represented almost a doubling of the supply of spectrum for broadband." Genachowski said that the United States is in a "small group at the very top tier of countries" when it comes to making wireless spectrum available for broadband and is committed to meeting its targets to stay ahead.

Gartner Study Looks At Risk Management

Companies that need to share data with external parties have a variety of different approaches and policies. When it comes to PaaS/laaS, 26% of organizations have a policy against putting sensitive data into SaaS, and 29% have a policy against putting such data into outsourced data centers, according to Gartner. "These results make sense, given that sharing data with a partner almost certainly means that one or more of its employees will

be accessing the data, while in a SaaS scenario, the data is typically only accessible to the primary customer," says Jay Heiser, research vice president at Gartner. When it comes to mission-critical data, 36% of companies have a policy against putting such data into an outsourced data center. About 30% of organizations say that policy applies to SaaS, and 22% say it also applies to IaaS/PaaS.

New Cloud Spec Approved

The Joint Technical Committee, which consists of the International Organization for Standardization and the International Electrotechnical Commission, has formally approved the first open standard specifically for data storage as a service as part of cloud computing. The Cloud Data Management Interface standard will increase the types of storage services that cloud storage providers can offer customers. In addition, the standard ensures interoperability and portability between service providers, according to the Storage Networking Industry Association's Cloud Storage Initiative Group, which submitted the standard for approval. Based on a RESTful HTTP protocol, CDMI pro-

vides both a data path and control path for cloud storage and standardizes a common interoperable data exchange format for securely moving data and its associated data requirements from cloud to cloud, according to the group.

IDC: Government Data Centers Should Prepare For Radical Change

An increase in mobile devices and quality cloud services, along with targets for system consolidation set by the Federal CIO Council, are causing government data centers to undergo a "once-in-a-generation shift," according to research firm IDC. In addition, government data center buildings are being moved to locations where prices for both real estate and electricity are lower, and they are being equipped with modular hardware and systems designed to maximize passive cooling and heating. In the report, "Technology Selection: The Government Datacenter of the Future," Shawn McCarthy, research director, IDC Government Insights, said that, because of varying budgets and preferences, these changes can take years to unfold, but the long-term trends are highly apparent.

IT Managers Standardizing On Microsoft Mobile Platforms

About half of all companies plan to standardize on mobile devices running the Microsoft operating systems Windows Phone and Windows RT. The survey, conducted by ThinkEquity, interviewed 100 IT managers from a variety of industries in the United States. Microsoft mobile OSes currently trail behind Google's Android and Apple's iOS in the smartphone and tablet markets. However, ThinkEquity financial analyst Yun Kim says the strength and longevity of Microsoft Office contributes to the desire for enterprises to standardize on Microsoft, noting that Microsoft is "well positioned to leverage its Office franchise to perhaps continue to dominate the corporate PC environment as the platform shifts from desktop/laptop to mobile device."

Investments In Renewable Energy Continue Strong Pace

New investments in renewable power and fuel were up 17% between 2010 and 2011, according to a new report from the Worldwatch Institute, with a total of \$257.5 billion invested in the sector. Solar, wind energy, and biomass and waste-to-energy technologies led the investments in 2011, garnering about \$150 billion, \$80 billion, and \$10 billion, respectively. The majority of investments were made in China, but investments in the United States grew 57% last

year, in part because of government incentives. The Worldwatch Institute reports that investments in renewable energy need to continue to grow in order to meet international climate targets and energy access goals.



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It's A Team Effort Between Your IT Department & Mobile Employees

MOBILE WORKERS AND TELECOMMUTERS are becoming a fact of life in small to midsized enterprises. And these road warriors or work-from-home employees need fast and reliable access to internal company resources just as much as someone working in the office. This is where VPN and other remote access solutions come into the equation. But how can you make sure that you are providing a secure, always available access point to your network without opening up your network to potential vulnerabilities? It takes a combination of the right solution, strong policies, and employee education.

Think About Data Security & Other Potential Issues

Before you start looking at actual solutions, you need to understand the risks

associated with remote network access so you can be prepared to counter them. "The obvious risks are that every VPN connection represents an attack vector that IT must monitor," says Paul Andersen, senior marketing manager at Array Networks (www.arraynetworks.com). "This creates a dilemma where productivity is at odds with security. Furthermore, VPN connections allow the transfer of data from the corporate network to remote devices such as laptops, tablets, and smartphones, creating the potential for data leakage in the event devices become lost, stolen, or hacked."

Robert Fenstermacher, director of product and solutions marketing at Aruba Networks (www.arubanetworks.com), agrees with Andersen and adds that "typically, remote access to the data center requires opening a bunch of holes in the corporate firewall." He says that while there are standards to protect against many of these vulnerabilities, implementing them requires complex or expensive solutions. This can lead to companies taking shortcuts and not fully protecting themselves. That's why many remote networking solutions provide onboard security options or let users add their own layer of security either at the server or device level.

Know Your Remote Networking Options

Data center managers are already aware of VPN-related remote-access solutions that provide secure access points for mobile workers, telecommuters, or other out-of-office employees. Fenstermacher says that these solutions are great for data centers as long as they have a "robust infrastructure with user authentication and device

Key Points

- Focus both on the security of your remote networking access points and the connectivity. Remote networking can only be truly beneficial if the connection is usable and secure.
- Research all available remote networking options and make sure they are a fit for your company and your workforce.
- Educate employees about potential risks that they are ultimately responsible for, such as losing devices or leaving a network connection open even after they're finished working.

onboarding." He also adds that for a VPN solution to be fully secure, companies



should invest in an equally robust network management system, or NMS. However, he says, it's important that whatever solution you choose is easy for end users to use, so they don't try to circumvent the security infrastructure.

Andersen recommends using secure remote desktop, which is an alternative to VPN. With secure remote desktop solutions, he says, "workers have a PC, laptop, or virtual desktop that stays on the corporate network" and gives employees "access and control of these desktops from wherever, using whatever device they wish." These types of solutions are particularly risk-averse because "remote devices and mobile devices never connect at the network level," which exponentially decreases the chances of data leakage or potential attack. But if VPN is an absolute necessity,

Andersen recommends companies use SSL VPN instead of IPSec VPN, because it gives companies "more granular control over access to the network and a great number of built-in security features."

Educate Employees About Security Risks

Even with a solid remote networking solution in place, there are still multiple opportunities for user error. That's why it's so important to put solid employee-based policies in place and help employees understand the implications of their network habits.

"Employees should be educated about how to operate when they are outside the corporate network and how to report issues, such as lost phones, to IT," Fenstermacher says. "Employees must be educated about the consequences to the company and themselves of security breaches so they don't take deliberate actions to impact information security."

To help avoid such errors, Andersen recommends implementing company-owned devices that can be wholly secured and managed by the company. But he also understands that BYOD, or bring your own device, situations will often come up in the workplace. In those cases, he points back to the secure remote desktop approach, which makes it much more attractive to allow BYOD in your company because of the lower risk. Even with a remote desktop solution in place, it's still important to outline some best practices employees can use to minimize potential security issues when remotely connecting to an internal company network.

Put An Emphasis On Network Availability

Once you have your security issues addressed, you should put just as much focus on improving the availability of the network. Andersen recommends finding a solution that provides redundancy and network intelligence. It should be a combination of applications that work together to "ensure persistence and failover in the event that any piece of the network infrastructure becomes unavailable," he says. The solution itself should have recovery or redundancy features built-in that provide an always-on network, but you should also be prepared for any kind of outage and have a backup plan for your employees to avoid any length of downtime.

Top Tips

Robert Fenstermacher, director of product and solutions marketing at Aruba Networks (www.arubanetworks.com), offers these tips:

- ✓ Make remote access as automatic and invisible as possible. The more the system automatically helps the user, the less chance the user will make a mistake.
- ✓ When granting access, consider the person's job function and the access rights she needs to do her job remotely.
- ✓ Use certificates that can be revoked on remote devices so that if they are lost or stolen, access to the network can quickly be disabled.
- Remote applications should be configured to ensure that data is not left behind on public computers. Enterprises should build in application security assuming that users will access applications from personal and public computers, not just corporate-issued laptops.

Action Plan

Paul Andersen, senior marketing manager at Array Networks (www.arraynetworks.com) recommends taking the following steps to make sure you're providing employees with secure, reliable remote access to your network:

- Triage or segment your potential remote access user pool. This will make your remote access points much more manageable.
- Determine how many users can be well served by the lowest-risk remote access method.
- For those requiring greater degrees of access to the network, determine how to support them while minimizing exposure.
- For those needing the greatest degree of network access, use more advanced VPN, such as SSL VPN, to retain a level of control over sensitive data.

Get Started

The best place to start with remote networking is to determine who needs access based on the type of remote location, such as fixed telecommuters or mobile workers, says Robert Fenstermacher, director of product and solutions marketing at Aruba Networks (www arubanetworks.com). He also adds that you need to know what levels of remote access these employees need in terms of speed, connectivity, and other important features, as well as what types of devices you will need to support on the network. All of these factors will help you understand the security risks and connectivity issues to expect and help you decide what type of remote networking access solution you should implement.

SIX QUICK TIPS

Improve Your Cabling Infrastructure

Stay Current With The Latest Technologies & Trends Designed To Provide More Flexibility, Scalability

IF YOU WANT TO simplify the process of making changes and additions in your data center, you need to have a flexible and scalable cabling infrastructure in place. But in order to do so, you should stay on top of the latest cabling trends and technologies.

"To improve overall uptime and make my staff more self-reliant, I insisted on a cable-management plan that makes deployment fast, easy, and scalable," says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). Having a cable strategy that is well-planned, organized, and executed, he says, is crucial during periods of installation and maintenance.

Cable management extends beyond uptime, Koty says. A neat, orderly data center reflects on everyone associated with the site "from technicians all the way up to the CIO." Cable management, he says, is "probably most important when current and potential customers come

to visit." Here are tips to improve your cabling infrastructure.

✓ Know The Trends

Jeff Clark, president of Lindy USA (888/865-4639; www.lindy-usa.com), says that with the growth in blade servers and similar technologies, there is a requirement for less cable density on the backside of your equipment, which has led to an uptick in the use of fiber-optic solutions. "We are starting to see more installers that are increasingly comfortable with the deployment of fiber-optic technologies," he says.

Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net), says there is no clear-cut recommendation for using copper over fiber (or vice versa). "Each one has its purpose, and the average data center will use a blend of the two," she says. As storage and bandwidth needs increase, however, managers might look to

fiber cabling as a viable option for preparing areas of the network for future growth and technologies, she says.

Tom Hodson, director of sales at Total Cable Solutions (888/235-2097; www totalcablesolutions.com), says the more notable trends occurring in data center cabling can be described in one word: density. "The smaller the diameter of the cable and the more compact a patch panel can be, the better," he says. "Airflow management, maximizing rack space, and doing more in a smaller footprint are strong trends today."

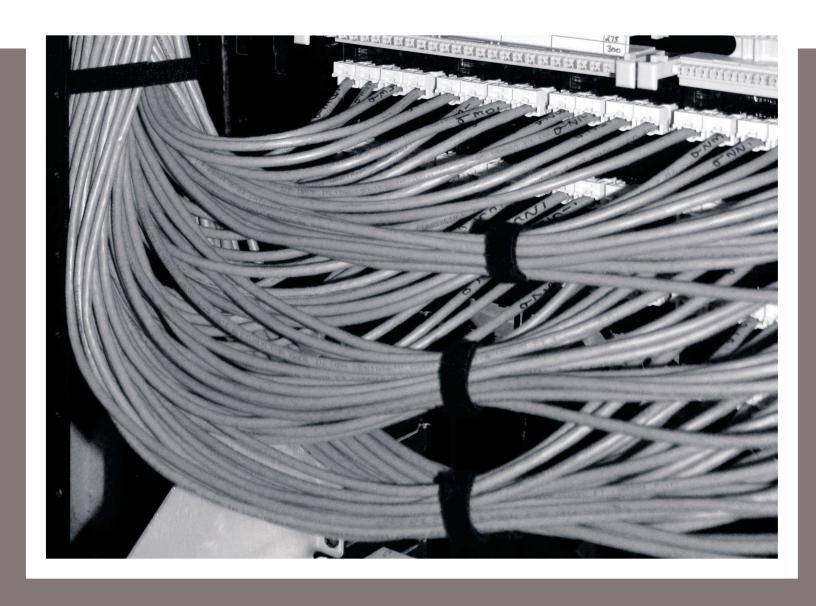
One approach toward this is using UL-Listed multi-circuit branch circuit power whips that minimize conduit runs above and under floors. Koty says "matching branch circuit power whip face-plate and box colors with conduit color is making power cable management an easier task." Other trends, he notes, include using elevated mounting positions and

integrated mounting hardware for branch circuit power whip receptacles, which protects against possible underfloor water and enables better airflow and improved CRAC unit efficiency. "Adding supplemental labels onto branch circuit power whip receptacle boxes, along with elevated mounting positions, makes identifying and isolating power feeds much faster and simpler," he says.

✓ Get Onboard With The Contractor

Koty says if your enterprise decides to use a cabling contractor, make certain first that you agree with the guidelines the contractor plans to implement and also have everything documented. "When your team installs add-on business, they need to follow the guidelines established by the contractor," he says.

Along with that, Lindy's Clark says, the data center manager needs to have a good



relationship with a vendor that he trusts. "These guys know their markets, and if they are the type of vendor that wants a relationship with you for years to come, they will help you choose the practical path for your future. By getting help in avoiding missteps along the way, you will save money," Clark says. "When choosing who you do business with, it is important to look for more than a low price."

✔ Plan For The Future

When eying data center cabling solutions that will ensure future flexibility and scalability, Koty says to remember that space is the most valuable commodity. A solution that's designed to save space should contribute to the future needs of today's data center. Koty recommends installing infrastructure that can handle a higher capacity than currently needed. "Then when steps are taken to increase densities, your systems

should be able to handle the load without being reconfigured, allowing for quicker and easier installation."

Clark agrees. "Always user a bigger conduit than you need, always have extra room in a tray, always be able to get physical access to everything, and think about how hard it will be to run a new cable later," he says. "It never fails, you will be running a new wire at some time. Also, leave some extra space in your rack. It never fails that you will need to stick one more piece of equipment in there that you had not planned to originally."

Overall, keys to a successful cabling strategy include using separate racks and pathways for each cable type and keeping copper, fiber, and power cables separate, particularly if using cable trays, Koty says. "A well-organized cable-management system also improves security by limiting human error when working with cables and improved airflow and cooling allowing for

higher densities," he says. In addition to creating separate pathways for cable types when designing cable layouts, allow room for cable management, access, and bend radius requirements.

Total Cable Solutions' Hodson advises anticipating N+2 technologies when investing in backbone cabling. Using OM4 for fiber runs, for example, can address today's 10GbE requirements and tomorrow's 40GbE and 100GbE speeds, he says. "It's important to choose cabling solutions that are feature-rich and future-proof, yet not proprietary as to limit your sourcing options," he says. "Looking for cabling solutions that are interchangeable and fully backward-compatible will make it easier and cost-effective to mix and match with your existing infrastructure investment."

✓ Simplify Additions & Changes

To ease the process of adding or changing cabling systems down the road,

Koty suggests having well-documented guidelines in place for labeling that are consistent for all cabling systems. "Make sure that new installations follow these guidelines so anyone familiar with the scheme can find what they are looking for," he says.

If cabling under the floor, he says, use cable seal grommets that provide flexibility when lifting panels and adding or changing out cables. Additionally, Koty says ensuring that cables will fit a given application and aren't excessively long will help facilitate airflow. When eying cable solutions that will make adding future components quicker and easier, he says, "using a colorcode system to establish different cable types and cable redundancies managed through separate cable pathways or trays makes isolating cables for addition, replacement, or troubleshooting a simpler task."

✓ Know Your Data Center

Ken Koty, sales engineer at PDU Cables (866/631-4238; www .pducables.com), says it's important to recognize that no two data centers are exactly alike. Before committing to a cabling solution, "understand the limitations that exist in the available space, either above the racks or below the floor," he says. "Often, your data center space will dictate which cabling solution is appropriate for you, regardless of the latest techniques."

✓ Communicate With Your Vendor

The data center manager and the hardware vendor need to communicate, says Jeff Clark, president of Lindy USA (888/865-4639; www.lindy-usa.com). "The data center manager needs to be able to clearly lay out what his short- and long-term goals are. The vendors (who know their products best) can aid in planning for the present as well as the future. They know what new things are going on in their industry."

BONUS TIPS:

✓ Pay As You Go

Tom Hodson, director of sales at Total Cable Solutions (888/235-2097; www .totalcablesolutions.com), says that by using a cabling system that allows for a "pay-as-you-grow" approach, data centers can minimize upfront investments but still provide scalability in coming years. "Use of modular patch panel designs and flexible patching options make growth easier and less disruptive," he says.

✓ Be Willing To Bend

Among the technology-related trends occurring in cabling, high-bend radius fiber cabling is one to keep an eye on. Hodson says the cabling type is quickly becoming a data center standard. "In the ever-changing world of faster protocols, having more 'headroom' and less performance impact from cable bends is driving this standard."

SIX QUICK TIPS

Plan A Server Refresh

Use New Servers To Implement More Efficient & Effective Features

IF THERE'S ONE THING in the data center that requires significant attention, it's your servers. A drop in performance creates a domino effect that can be felt by anyone within the company and even by customers outside of the organization.

For every data center, there comes a time when a server refresh is needed to beef up capabilities, increase energy efficiency, and ensure that your company will always be up and running to serve customers. We'll show you a few things to keep in mind when going through a server refresh that should help you save money while still getting the performance and features you need.

✓ Know When It's Time For A Refresh

Clemens Pfeiffer, CTO and founder of Power Assure (888/225-1575; www.power assure.com), says there are a couple of sure signs it's time for a server refresh. For starters, when new servers use so much less power and space that it's less expensive to replace the old ones than keeping them running, it's time for an upgrade. Also, when compute needs are expected to surpass current IT capacity and key performance indicators show data center performance may start to degrade, planning needs to be done ahead of time and regularly updated so that IT projects the right time and criteria for a hardware refresh.

"Moore's Law tells us performance doubles approximately every 18 to 24 months,"

Pfeiffer says, "therefore, it is prudent to consider a hardware refresh every three years in order to take advantage of the latest performance improvements and technological advances in the IT industry." Trends such as virtualization and cloud computing may necessitate review of the IT strategy and refresh cycles earlier than planned, he says.

✓ Look Into Upgrading Components First

You may assume that a server refresh requires an overhaul, but it's possible to simply swap out components, such as hard drives or network devices, to give your servers that extra boost. "Provided a customer sticks with industry-standard chassis and rack solutions, swapping out

components or systems for higher efficiency models are the most cost-effective paths to hardware upgrades," says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). "Depending on supplier and processor roadmaps, a refresh can start at the component level upgrading HDDs to SSDs or installing faster memory and higher bandwidth interconnectivity options."

Clegg also points out that you can upgrade the BIOS on a motherboard or upgrade your CPU and other components. It's possible to keep your existing racks and overall infrastructure setup without completely starting from scratch. And you can refresh over time rather than all at



once, letting you spread out the costs associated with server upgrades.

An Opportunity For New Technology

Buying new energy-efficient servers gives you the option of upgrading the base features of your server. You can invest in not only the features you'll need now, but the features you'll need as your company continues to grow. Two such features, which often go hand and hand, are consolidation and virtualization. You may be able to replace two or three older servers with a single new unit, which can free up additional space for other pieces of equipment or increase the overall airflow of your data center. And you can

implement server virtualization, which can lower your costs for individual computing platforms for employees.

"Virtualization has become a mainstream practice, and it can be used to assist consolidation by allowing multiple application workloads to share the same physical servers," says Jenna Maertz, research analyst at Info-Tech Research Group. "A combination of server consolidation and virtualization can save between 40 and 75% of upfront and ongoing hardware costs, making a server refresh significantly more affordable."

Beware The Hidden Costs Of Old Equipment

You may be tempted to hold on to your older servers for as long as possible. But

there's a downside. "As a general rule, servers should be replaced every four to five years," Maertz says. "Keeping aging equipment longer than this timeframe puts you at risk for actually spending more than if you just replaced the servers in the first place. You may save on the initial capital investment, but there are hidden costs to keeping old equipment."

Some of these hidden costs include additional hardware investments, such as replacement parts, system adjustments, and add-ons, Maertz says. She also says that installing and running newer applications on older hardware can lead to major compatibility issues and the need for expensive server upgrades in a short amount of time. And servers that have

been used extensively for a longer period of time are more prone to breakdowns.

Server upgrades are also a good time to take a different approach by better integrating new servers during a refresh, Maertz says. "Stop taking a silo approach to server deployment and start thinking more holistically," she says. "Your server infrastructure is like a puzzle. There is one overall picture, and you need to put the pieces together to make it all fit. You have X overall requirements and X total capacity; now, figure out how the pieces fit by dividing your applications across your available servers, using multiple applications on each physical server. Be sure to take into account both current and future capacity for your application workloads."

✓ Become More Energy Efficient

Implementing a server refresh provides a great opportunity to be more efficient environmentally and in terms of energy consumption. Older servers will often draw more power than newer, more efficient alternatives, so it may be more cost-effective to buy brand new servers as opposed to trying to maintain your existing ones. Improved energy efficiency can also lead to savings elsewhere. It will reduce the need for constant maintenance and repair, which can free up your IT team's time for other projects. And it can also make your other systems more efficient.

"Energy consumption for data center cooling is rising," says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com). "The only way to curb this runaway cost and be more environmentally friendly is to transition to energy-efficient servers that operate at higher ambient temperatures and reduce dependency on air conditioning."

✓ Communicate With Your Vendor

When going through a server refresh, you should be in constant contact with your vendor to not only ensure you are getting the features you need, but to request additional services that may be provided for free. "A helpful tip is to ask vendors to help with capacity planning," says Jenna Maertz, research analyst at Info-Tech Research Group. "Many vendors will try to win your business by offering free workload modeling services and tools, which can help you determine the capacity requirements for both your virtual and non-virtual workloads. This can help ensure that you get the maximum capacity out of each of your servers."

BONUS TIPS:

✓ Get Facilities Involved

Clemens Pfeiffer, CTO and founder of Power Assure (888/225-1575; www .powerassure.com), says any server upgrade needs to include representatives from both the IT and facilities sides. "It's no longer sufficient to think about IT and facility as two distinct functions. With temperature and power consumption available from servers, this information needs to be fed to the facility environment."

Along those lines, you need to take a look at power, space, and cooling resources when selecting servers. "Operators need to make sure there is enough infrastructure capacity in place to support the new servers," he says.

✓ Upgrade Your Racks & Chassis

If you don't already have standardized racks or enclosures for mounting multiple equipment modules, then a server refresh is a great time to make that change. "Look for server solutions with designs incorporating sliding rails and tool-less chassis access for easy maintenance and access to hot-swap hard drives, power supplies, fans, and other components that may need replacing," says Don Clegg, vice president of marketing and business development at Supermicro (408/503-8000; www.supermicro.com).

SIX QUICK TIPS

Enterprise Tablets: Major Issues To Consider

Data Center Managers Face Concerns About Security, Network Traffic & Bring Your Own Device

SIMILAR TO HOW smartphones started infiltrating office environments years ago, tablets are increasingly showing up in enterprises. And while these devices can provide considerable functionality and help improve productivity, they can also introduce unforeseen problems to a company and its resources. When looking to implement tablets in your company or trying to find ways to support an existing influx, here are the issues you need to be aware of to make sure you are fully prepared.

✓ The Right Tablet For Your Environment

As tablets continue to get more similar in terms of features and functionality, it may seem like any tablet will work for your employees. But the truth is that even though manufacturers are closing the gap on each other, there are still quite a few things to consider when comparing tablets. For instance, if users are going to be consuming considerable content, it may be helpful to invest in tablets with larger screens. If employees will be using tablets to create content, a keyboard attachment can make productivity faster and easier. But you also may need something that is flexible enough for both uses, so you don't end up with a device-segmented workplace.

"Hybrid tablet/laptops have been attempted over the years but always end up bringing the worst of both worlds," says Michael Battista, Ph.D., a research

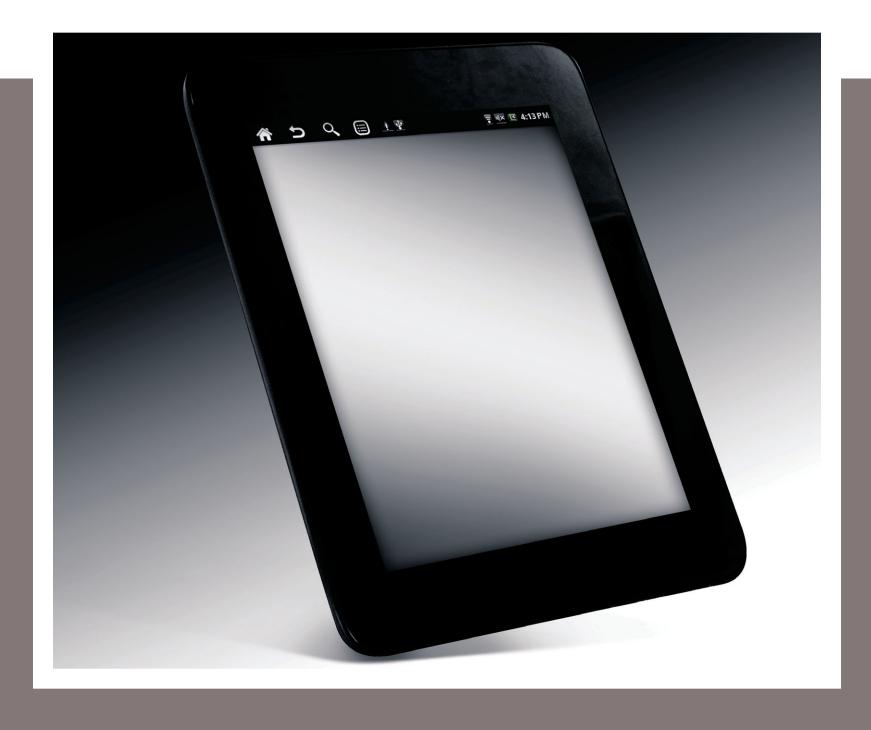
analyst at Info-Tech Research Group. "There is more potential in a modular approach; for example, I have a case on my iPad that is also a keyboard. In most situations, it can do anything a laptop could, but I can also take it out and use it as a standalone tablet."

Consider The Inherent Security Risks

As with any device, there are security risks specifically associated with tablets. "Tablets are small, so they tend to be brought everywhere and often left lying around," Battista says. "If the device didn't have a passcode to unlock it, that could mean super-secret company data gets out there for anybody to take a peek

at." Battista adds that tablets are also seen as being less manageable than traditional computers because they are based on operating systems that "weren't designed with businesses in mind." This leads to many IT departments not having the expertise or experience to tightly control tablets.

As for the security risks, companies simply need to make sure employees are always aware of their tablets and understand that they can be a key for any thief to unlock sensitive company information. Battista recommends companies make it policy to put passcodes on tablets and also make it so tablets can be remotely wiped if lost or stolen. He also adds that to help improve manageability, companies can invest in mobile device management suites



that, "through a combination of backend infrastructure and on-tablet agents, can bring tablets to a manageability level approaching what companies have gotten used to with Windows-based PCs."

✓ Be Ready For BYOD

Because tablets started out primarily as consumer devices, it's safe to assume that employees will end up bringing their own mobile devices to the workplace. And while they may also use them for personal use, there is the potential that they may want to perform work tasks with them, too. In a recent Forrester report "Prepare For Anywhere, Anytime, Any-Device Engagement With A Stateless Mobile Architecture," vice president and principal

analyst Chenxi Wang, Ph.D., writes that "unmanaged devices are a fact of life" and "gone are the days when IT can demand to manage devices on the corporate network and rely on being heard."

Still, companies aren't completely left in the dark when it comes to BYOD. It's simply a matter of learning "to incorporate unmanaged user devices as part of their ongoing business strategy," Wang writes. One course of action is to implement policies for when it is appropriate to use consumer-owned devices in the workplace. It's also possible to set up VPNs so users don't actually save any sensitive content on the devices themselves but can still access them to complete tasks. It's nearly impossible to prevent employees

from bringing their own devices to the workplace, so it's important to be flexible without leaving yourself vulnerable to security threats or a networking burden, the report notes.

✓ Can Your Network Handle The Traffic?

Whether your company decides to issue tablets to the workforce or you support a BYOD policy, the increased traffic could have a dramatic effect on your network. Most companies "did not account for the increased traffic demands of an empowered workforce" early on and are now suffering, to a degree, because of it, Wang writes. As an example, Wang points out that AT&T actually saw a 5,000% increase

in traffic from 2007 to 2010, which led to slower speeds and spotty connections during that time.

Data centers can use this as a cautionary tale when it comes to bringing enterprise tablets into the workplace or letting employees bring in their own devices. If your wireless network isn't ready ahead of time, you could incur bottlenecks that not only harm the connection speeds of tablets, but also every other device in your company. You should consider how many devices will connect to your network at any time and how much of your networking resources they will use. Then plan accordingly to avoid overly taxing your network and possibly incurring downtime.

✓ Assess The Need For Tablets

Before you even start looking at which tablets to purchase, make sure that your workforce will actually use them. Letting employees bring in their own devices is one thing, but choosing to issue tablets or fully support them should be a needs-based decision.

"Most companies should be preparing for an increasingly mobile world regardless, but if they are officially supplying or supporting tablets, make sure there is an actual use case for it," says Michael Battista, Ph.D., a research analyst at Info-Tech Research Group. "Tablets are increasingly ready for real work, but only certain kinds of work. Don't jump on the bandwagon just because it's what the cool kids are doing, but also don't resist change if it has a purpose."

✓ Build A Mobility Team

Chenxi Wang, Ph.D., vice president and principal analyst at Forrester Research, writes in her report "Prepare For Anywhere, Anytime, Any-Device Engagement With A Stateless Mobile Architecture" that companies should "put together a mobility council" that consists of "representatives from app [development], networking, client management, security, and business." This team will be able to assess the company's needs and find ways to meet them.

"Because most likely there is not a solution out there that will provide everything that you want, the mobile team will have to craft compensating controls, deliver stop-gap measures wherever necessary, and work with the rest of the IT to ensure the success of mobile delivery out of the mobile chaos," Wang writes.

BONUS TIPS:

✓ Don't Sweat The Specs

"It's not about specs anymore," says Michael Battista, Ph.D., a research analyst at Info-Tech Research Group. "Any two tablets can have exactly the same specs but widely different user experiences and capabilities." Instead of getting held up on specs, companies should instead look at operating systems and form factors (or screen size).

✓ Aim For Company-Wide Compatibility

If you can supply the same tablet to every user, it will help your IT team be able to secure and manage the devices and easily make updates or whole-sale changes if necessary.

SIX QUICK TIPS

Move A Data Center

Avoid Management Headaches & Ensure A Successful Relocation

MOVING A DATA CENTER can be a stressful process. Not only do you have to manage a large-scale shift of equipment and software to a new location, you also have to make sure you aren't impacting the productivity of employees at your current facility. And once everything arrives at the location, the installation and implementation of solutions is a seemingly insurmountable task in its own right.

Fortunately, you can take some steps to ease the pressure of moving your data center by stressing the importance of planning, seeking help when needed, and upgrading your systems whenever necessary to ensure your new data center performs even better than your previous one.

Plan, Plan, Plan

For the data center move to go as smoothly as possible, it's important to set up an in-depth plan that takes every possible facet of the move into consideration.

"A data center relocation can be best described as a controlled disaster that involves high risk and requires a minute-to-minute plan for execution," says Melanie Davy, senior research analyst for Info-Tech Research Group. "Organizations should start by assessing upgrade opportunities to de-clutter the move. Upgraded or refreshed equipment can be installed directly in the new facility shortly before the move—instead of taking it with you—and decrease the risk of moving certain equipment."

Davy says that one of the most important parts of the data center relocation plan is the order in which certain systems will be moved and installed. For instance, she points out failure of a phone system could result in loss of productivity and business and is therefore extremely risky to move. You could choose to upgrade your telephone system by installing it at the new data center site right away, which would provide enough time for proper testing. Davy also recommends putting hardware and software pieces into bundles, which are components that must be moved together. This will ensure that once something is installed, it can be used almost immediately.

But even before you move in a single piece of hardware, you should do a walkthrough of the new data center space to make sure it's ready for installation. "Conduct your due diligence for the data center facility with an inspection before the move day," Davy says. "Once the facility has been cleared, pre-staging of upgraded systems can begin, such as racks, network gear, power cabling, etc. Constant communication with the facilities team will ensure that, come move day, there are no surprises."

✔ Consider Hiring A Moving Company

You may have the urge to perform the data center relocation yourself in order to save money, but this could end up causing



you to cut corners and have an ultimately unsuccessful move. There are many data center moving companies in the industry that are specially trained in data center relocation and have vast experience with the process. Data center moving companies can help during planning and aid you all the way through the relocation process with helpful management-related advice. They can also utilize your internal IT team to make sure your company is kept in the loop throughout the move. For most businesses, experts say, it's a good idea to invest in a moving company upfront instead of paying for potential mistakes later on.

"If you don't want to supervise every step yourself, an experienced data center moving company can provide vendor management and control the migration environment to maintain your budget and schedule," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmount solutions.net). "By considering your needs and defining the project scope in advance, an experienced data center moving company can ensure that there will be no unexpected costs associated with the move."

✓ Avoid Running Up Your Moving Expenses

Despite all the planning and preparation, budgeting can be a tricky area, especially during the move itself. That's why Davy says it's so important to include every budget item up front. You have to account for potential one-time costs that may occur

during the relocation process and be prepared for potential future costs if your data center move is being done in installments. It's important not to lose track of any aspect of the moving budget, or you could end up spending more money than you originally anticipated.

However, once the budget is written down and finalized, that doesn't necessarily mean it should be set in stone. You must be adaptable to issues that may arise during the move. "Revisit the budget often," Davy says. "After the initial budget has been determined, be sure to revisit it throughout the term of the project and get sign-off on any changes. It is better to makes changes to the budget throughout the project than to come out over budget in the end."

✓ Lay Down A Future-Proof Foundation

Moving your data center should be looked at as an opportunity to start over. You don't necessarily have to overhaul your entire business approach, but you can make a few small- or large-scale changes that can improve your data center and put it in a much better position for future use. "Organizations should look for upgrade opportunities when planning a move," Davy says. "Data center relocation provides an opportunity to leave behind sins of the past. Follow best practices on data center design for cooling, cabling, and placement of equipment, as well as virtualization to save space in the new data center."

✓ Round Up The Troops

One of the most important parts of moving a data center, yet one that's easy to get lost in the shuffle, is ensuring that every employee or contractor involved in the move understands their part and is ready to contribute. If the employees and/ or the moving company aren't working as a team, then the move will not go as smoothly as planned.

"Continuously monitor and evaluate the mission-critical relocation," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmount solutions.net). "Make sure you define roles and responsibilities to eliminate confusion on move day and maintain efficiency to keep costs down. If you are using a moving company, make sure your staff and their POC understand everyone's exact duties and what they are responsible for."

✓ Establish A Relationship With The Moving Company

If you do decide to take advantage of a data center moving company's services, then you should make sure the company is reputable and will clearly lay out everything you're paying for.

"Request statements of work from all vendors under consideration to get an idea of vendor expectations, requirements, and pricing," says Melanie Davy, senior research analyst for Info-Tech Research Group. "Ask for references from recent clients with projects of similar scope and magnitude to verify the vendor's claims. The median cost of third-party service providers was over \$6,500/rack, accounting for 45% of the cost of the move, according to a recent Info-Tech survey."

BONUS TIPS:

✓ Map Out The Necessary Connections

"Make sure you have all technical documentation and connection mapping, detailing all connections, power requirements, and IP addresses, so everything goes back exactly as before, unless you are using this opportunity to redo or revise your systems," says Deborah Petty, president of Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

✓ Avoid Downtime Through Preparation

"If parts of your operation need to stay up and running during the move, coordinate ongoing business in phased moves, reducing the impact on your business and employee productivity," Petty says.

SIX QUICK TIPS

Transition To 10GbE

Make The Move To Faster Networking As Painless As Possible

FOR SOME ENTERPRISES, the move to a 10 Gigabit Ethernet infrastructure has already occurred, and the same migration appears in the cards for many others soon.

According to a report from Dell'Oro Group, 10GbE revenue will account for more than one-third of overall market revenue in L2-L3 switching this year. The research attributes the growth to continued data center deployments using 10GbE top-of-rack and blade switches. Moving forward, says Alan Weckel, Dell'Oro Group senior director, most new high-end servers will be 10GbE.

Here are tips and advice to follow when making the transition to 10GbE.

✔ Define Your Purpose

A major component of transitioning to a 10GbE infrastructure is determining the purpose of the move—or, as Shaun Walsh, senior vice president of corporate marketing at Emulex (www.emulex.com), asks, "What are the applications driving it?" In most cases, he says, "we've seen [the driver] be 10-gig NIC partitioning or creating virtual NICs for server virtualization."

Although there are relatively few applications that absolutely need 10Gb bandwidth, he says, "when you start consolidating between seven and eight servers per system, you then want to be able to divide up those pipes and allocate the bandwidth to each of those virtual environments with a certain level of SLA, and we've seen that happening predominantly in the blade market to start because you don't have the cost of optics and optical cables."

Bob Laliberte, senior analyst at Enterprise Strategy Group, says organizations must recognize the importance of the network in the future evolution of their IT environments.

In terms of data center consolidation, he says, between increased use of server virtualization and Web or SOA applications, data centers are taking on massive scale. "The network must be able to handle that increased traffic."

Laliberte adds that new servers are now out and are a lot more powerful, which should result in greater VM (virtual machine) densities and increased throughput. "In fact, the No. 1 reason for transitioning to 10GbE, according to respondents to a recent ESG survey, was to support server virtualization initiatives," he says. Thus, companies should thoroughly understand their plans for virtualized server environments and planned and unplanned VM densities, he says.

✓ Plan Ahead

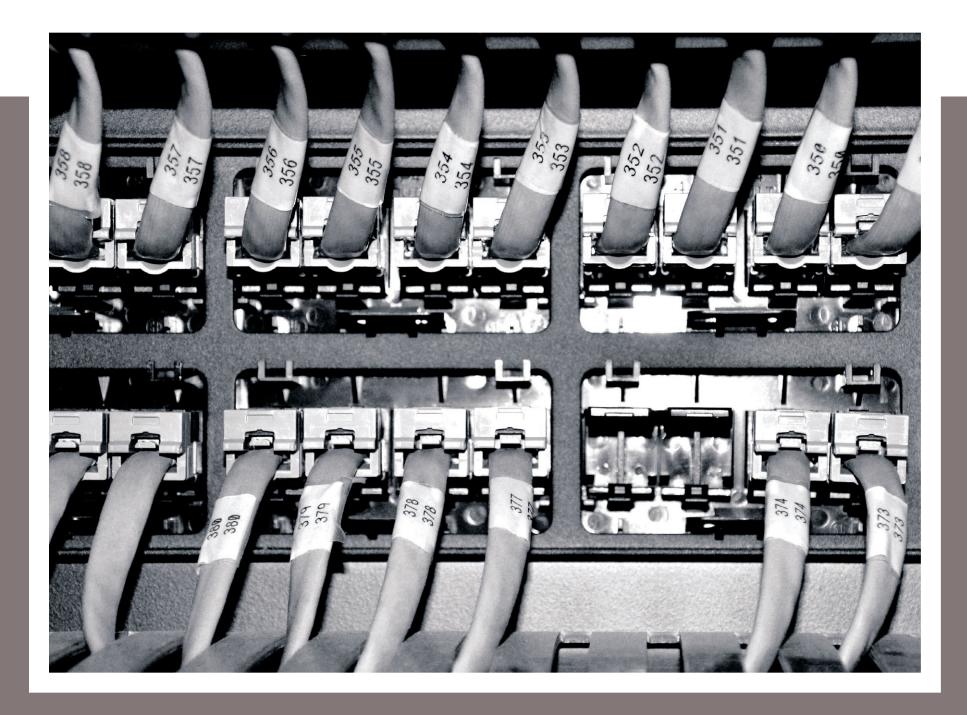
To contain 10GbE transition-related costs, Mike Hronek, networking solutions architect at CDW (www.cdw.com), says

enterprises should plan for what 10GbE needs will be three to four years from now.

"Purchasing decisions should be made off of that plan, not what the immediate needs are," he says. "It can be more expensive in the long run to piece 10GbE together rather than add small parts to an existing solution that's designed to accommodate network growth."

Weckel says foremost, enterprises should address virtualization when developing 10GbE plans. Knowing where and what the enterprise will virtualize will help determine if there's a need for convergence, low-latency products, or investment in production of the existing install base, he says. Each of these areas involves a different deployment and a set of products, he says.

Walsh advises looking at bandwidth usage in the planning phase. "I know that seems a bit obvious, but look at both storage



and your network growth. Are you going to continue with standalone rack servers? Are you moving to the cloud? Or are you going to do some sort of data center consolidation? This is the one area where most people do get bitten."

When sizing up vendors, Laliberte says it's unlikely organizations will switch out the entire environment at once, "so understand how 10GbE will co-exist with 1GbE—interoperability, management, etc. This is also an opportunity to evaluate other vendors and their technologies."

✓ Know The Trends

Weckel says that although it's too early to speculate on server vendors' choice of connectivity (blade, 10G Base-T, SFP+ direct attach copper), Dell'Oro Group analysts report trends are emerging that will require most vendors to have "significantly more" offerings for 10GbE than

1GbE. "For 1GbE, the main connection types seen are 1G Base-T, fiber, and blade (KR)," he says. "For 10GbE, we anticipate at least two copper methods for rackmount servers (10G Base-T and SFP+direct attach copper), but also several types of products."

At the least, Weckel anticipates a fragmented market of customers eyeing unique products, including high-performance or low-latency offerings, convergence of Fibre Channel and storage (iSCSI, for example) solutions, low-cost cloud offerings, and auto-negotiating solutions to protect existing 1GbE servers (especially important in SMBs, Weckel says).

"For these reasons, we expect vendors will most likely specialize in a particular area within the data center or have a large portfolio of products to address customer requirements," he says.

V Avoid Roadblocks Such As Costs, Downtime

Among the hurdles enterprises could encounter when transitioning to 10GbE, Laliberte says, are new equipment costs, downtime required to deploy new equipment, and potential resistance from the storage domain if planning to run converged networks without first getting buy-in.

Additionally, he says, "10GbE can saturate network management tools, so users should assess NPM, APM, and security tools capacity, as they may need to upgrade tools or implement iMAN. Better to know and plan for this than be caught off guard."

Hronek says enterprises commonly use the wrong switch for the wrong application because "they may not realize that some are designed specifically for server connections and others are designed specifically to support the network backbone." Because enterprises can use 10GbE for both applications, he says, "they need to match the switch to the use. Enterprises don't always realize that the simple presence of 10GbE ports doesn't mean a switch will support all 10GbE lines equally."

"The key is to change the mindset from servers to applications," Weckel says. "Applications are key to businesses moving forward and with multiple devices (such as iPhone, iPad, and PC) accessing them." Successful enterprises think of the data center as a service to customers, both employees and actual customers, he says. "Those that provide customers with an advantage are using technology successfully. Those that don't will struggle," he says.

✓ Factor In The Cost Of Cabling

"Using fiber connections is where enterprises typically run into trouble," says Mike Hronek, networking solutions architect at CDW (www.cdw.com). "Many enterprises have OM1 fiber run on their network, which is most commonly used for 100 and Gigabit fiber runs." However, this isn't the best option for 10GbE, he says. "Enterprises normally need OM3 fiber to support 10GbE. Therefore, enterprises need to take the potential cost of new cabling into account when looking to upgrade to 10GbE. They might also need to run single-mode fiber if the distance is too far."

✓ Deploy 10GbE Gradually

Enterprise Strategy Group senior analyst Bob Laliberte says enterprises can save money by leveraging a phased approach that targets the most performance-sensitive apps or private clouds first and expanding deployment over time. "This needs to be carefully mapped to the server virtualization and private cloud rollout in order to avoid potential issues," he says. Enterprises could potentially use copper vs. fiber connectivity, he says, although Enterprise Strategy Group research indicates that most enterprises are aggressively moving toward fiber.

BONUS TIPS:

✓ Involve Everyone

"Highly dynamic enterprise IT environments are interdependent on other technology domains, so be sure to include server, virtualization, and storage teams in your discussions," says Enterprise Strategy Group senior analyst Bob Laliberte.
"Understand what other technologies may be required (NICs, storage adapters, etc.). Understand the roadmap to the next technology (40GbE and perhaps even 100GbE) to keep expansion capabilities open."

✓ Address Matters Of Connectivity

According to Shaun Walsh, vice president of corporate marketing at Emulex (www .emulex.com), during 10GbE planning, enterprises should ask, "What are the WAN connectivity requirements and other things that attach to your network? Is the switching and hardware you're picking still backward-compatibile with those [and] with what your telecom provider is bringing in for pipes for the outside world? What type of routers do you need for dealing with cloud applications and those sorts of things?"

SIX QUICK TIPS

Improve Your Fire Protection Capabilities

Be Aware Of Newer Hazards, Standards & More

A FIRE CAN BE one of the most devastating and detrimental events in a data center. And with so many pieces of equipment packed tightly into a room, there are plenty of opportunities for things to go wrong. Making sure your current fire protection system can handle the heat could mean the difference between experiencing crushing downtime or a minor inconvenience.

✔ Be Aware Of Newer Fire Hazards

If your data center has been around for quite some time, your fire protection system may not be adequate enough for some of the newer fire hazards related to emerging technologies. For instance, a hot aisle/cold aisle containment system can be "one of the most significant challenges to fire suppression systems today since containment of any type creates obstructions to fire suppression systems," says Tina Nelissen, vice president of national clean agent sales at Amerex (www.amerex-fire.com). "Retrofitting an existing data center with hot aisle/cold aisle containment or modifying an existing aisle containment design without involving a fire protection professional can result in a failure of the suppression system to operate as designed."

Consolidation, one of the most common cost-cutting measures in data centers today, also has the potential to create fire hazards. "Today's downsizing of data centers, along with significantly increased rack density, can result in additional fire

hazards," Nelissen says. "Such faults could trigger an event that wipes out both equipment and data from existence, and the risk isn't limited to huge data centers packed with equipment. The importance of the equipment and data stored in small to midsized data centers is the same as it is for large data centers, and the level of protection should not be sacrificed."

Know Applicable NFPA Regulations

The NFPA, or National Fire Protection Association, regularly releases codes and standards related to fire protection across multiple industries and building environments. For data centers, it isn't necessary to memorize every single regulation, but there are a few helpful ones to be aware of. For instance, Nelissen recommends data center managers start with NFPA 75: Standard for the Fire Protection of Information Technology Equipment, 2013 Edition, which addresses minimum fire protection for data centers, including both passive and active fire protection. This will at least give you a good foundation for improving your fire protection capabilities and may help you find places where your current system is lacking.

Nelissen also says that companies with a Clean Agent or Waterless Fire Suppression System should be aware of NFPA 2001: Standard on Clean Agent Fire Extinguishing Systems, 2012 Edition, as well as certain sections of NFPA 72: National Fire Alarm and Signaling Code,



2012 Edition as it applies to clean agent fire suppression systems.

✓ Consider A Clean Agent System

When looking to upgrade your current fire suppression system or designing a new one for a data center build or renovation, you may want to consider a clean agent system rather than traditional water-based alternatives.

"I have spoken with many people who have experienced a fire that were protected by a clean agent system, and every one of them was thrilled with the protection they received from that system," says Brad Stillwell, director of mechanical products at Fike (www.fike.com). "On the contrary, I have spoken to people and read articles of the system where the fire had to grow

so large that it heated a sprinkler device to activation, at which time there was a great deal of smoke damage. The addition of water to the hazard only complicates the issue with power concerns, downtime, and cost of the cleanup. There is additional cost for the clean agent system, but the added protection is immeasurable."

Another benefit of clean agent systems is the ability to add additional protection as the facility expands, Stillwell says. Most data centers will need to add new equipment at some point in the future, and with a clean agent system, expansion is much easier. "Many times data centers are forced to expand as the demand for processes and data storage grows," Stillwell says. Adding detectors and additional containers to account for the increased protected

volume is no greater cost per volume than the original installation and, in most cases, the original control panel is just expanded to cover the additional detectors.

Focus On Maintenance Before Change

In some situations, you may not need to make changes to your fire protection system. Instead, it may be more helpful to simply set up a better maintenance plan that ensures the system is working as intended. "Changes are not always necessary," Nelissen says. "Proper maintenance of existing systems by trained and certified personnel is critical. A qualified fire protection vendor will be trained by and have a current certification from the original equipment manufacturer (OEM) for the

particular system they are installing, testing, or maintaining."

Stillwell agrees, adding that it's important to consult your fire protection system provider if you plan on any changes in your data center. "Check with your fire protection professional before undergoing a major overhaul to your data center, so you know that modifications will not affect fire protection system performance." For instance, if you plan on expanding the data center room with more equipment, you may need to expand your fire protection system as well. A reputable vendor should be able to make adjustments to the overall system to ensure that, regardless of how your data center changes, your most crucial equipment will be protected from fire or heat damage.

✓ A Checklist For Selecting A System & Agent

Tina Nelissen, vice president of national clean agent sales at Amerex (www.amerex-fire.com), says there are a number of questions to ask yourself or a vendor when trying to select a fire protection system and fire suppression agent:

- ✓ Has the EPA approved the agent for use in normally occupied rooms?
- ✓ Does the agent have a history of use in this application?
- ✓ Is the agent readily available for system recharge?
- ✓ Will other auxiliary systems need to be installed to allow the fire suppression system to work properly? (For, example, pressure relief venting systems.)
- ✓ Is the system listed by a third-party testing laboratory such as Underwriters Laboratories (UL) or Factory Mutual (FM)?
- ✓ What is the expected cost of installation and maintenance over the life of the system?
- ✓ What impact will the installation have on the data center operations?
- ✓ If the system is deployed, what type of cleanup is required? How will cleanup be accomplished and will the data center experience downtime?

✓ Install A Reliable, Flexible Fire Protection System

Choosing a fire protection system requires quite a bit of research and forward thinking, which is why it's important to look for one that will last well into the future and have the full support of the manufacturer behind it.

"With regards to what to look for in a system, I would recommend the most flexible system with the best performance and a good cost," says Brad Stillwell, director of mechanical products at Fike (www.fike.com). "I know that sounds like a lot to ask for, but I believe systems are available that offer the users all of it. Selecting a system manufacturer and installer with a proven track record is critical. It is important the day the system is installed but it is equally important to have quality, reliable business partners for service."

BONUS TIPS:

✓ Do Your Due Diligence

"Utilize a system with a proven track record of successful operation," says Brad Stillwell, director of mechanical products at Fike (www.fike.com). This is why it's particularly important to compare multiple systems upfront, talk with vendors, and try to find testimonials or talk to customers that have actually had to use the system.

✓ Look Toward The Future

Stillwell also says it's important that companies evaluate the long-term cost to maintain the fire and life safety systems. The costs of some fire protection systems can be larger upfront, but if you invest in a reliable system now, you won't have to worry about replacing damaged equipment due to a malfunctioning or inadequate system.

SIX QUICK TIPS

Dispose Of Old Storage & Media

Protect Your Company Through Proper Data Eradication

YOUR DATA CENTER WAS BUILT to store vast amounts of information, both mundane and highly sensitive. So when your storage devices are in need of an upgrade or a refresh, that data needs to be protected or completely eradicated.

"Most companies are in possession of customer and employee data that criminals would love to have," says Joe Mount, director of business development at Tabernus (www.tabernus.com). "Companies spend a lot of money and resources protecting their network from outside attacks and ensuring that there are no vulnerabilities or compromise of data from their networks. Companies must also undertake this same level of protection with data that exists on storage devices

at end of life when a company decides to upgrade or replace their storage solutions."

Storage devices not only hold financial information for the company, but personal information about customers and employees. If a drive isn't properly wiped before reuse or resale, it could result in the loss of credit card numbers, banking account information, and Social Security numbers, Mount says. Here's what to look for in a data disposal service provider and how to make sure that your data center isn't compromised by stolen data from recycled or reused storage devices.

✓ Go Beyond Erasing Your Own Data

You may think that simply erasing the data from your storage devices before

disposing of them is enough. But if there isn't an expert in data removal at your company, you can't be sure your data has been properly removed and protected.

"Companies may elect to perform data erasure or data destruction themselves; however, for most companies, this is not their competency and this is usually a distraction from their core business," Mount says. "Companies should consider using certified solutions, accredited IT asset disposal, or IT service companies when considering options for properly disposing of their IT equipment."

A majority of devices in your data center or office environment are capable of storing data, so Mount recommends finding a company that is "familiar in handling your type of equipment, whether it is tape, data center equipment, servers, PC clients, mobile devices, or printers." Whether you're disposing of vast tape libraries or small SD memory cards, it's a good idea to enlist the help of an experienced service provider.

✓ Compare Multiple Vendors

As with any service-related purchasing decision, it's important to compare as many vendors as possible to not only get the best deal but also the highest quality performance. Norm Hutton, head of sales and acquisitions at WeBuyUsedTape. net (www.webuyusedtape.net), says that in order to make sure your data is safe, you need to be able to trust the company you're doing business with. He recommends getting references early on in the



comparison process and calling past clients to ask about their experience.

Data disposal companies should also be reputable and financially stable, Hutton says. If the vendor has been in business for a long time, that's a good sign that its processes are well-honed and your data will be in safe hands. Hutton stresses that disposal companies should "not just be brokers, but actually provide a product or service that is beneficial to your project." If you can find a data disposal company that's a one-stop-shop, you'll save more money in the long run.

✓ Determine Your Disposal Method

Choosing a data disposal company isn't the end of the decision-making process,

because you then have to determine the best eradication method for your data and drives. "On the data removal side, the client has three options: physical destruction, degaussing, or data wiping," Mount says. "Physical destruction and degaussing turn a hard drive into a non-functional device, and it can be scrapped for minimal material value. Data wiping, or overwriting white space on the drive, maintains its functionality when removing sensitive data and allows it to be repurposed or resold at a higher value."

Regardless of method, the disposal company should be able to completely erase your data and provide a report detailing its process. Mount also stresses how important it is to get documentation from the vendor that clearly details "what happens to all your equipment, whether it's crushed, wiped, sold, or passed on to a downstream supplier." You should also make sure the vendor is following environmental guidelines to give you even more peace of mind.

✓ Consider Using Sales To Fund Future Projects

If you decide that your used equipment is in good enough condition to wipe and resell, you should determine how much each piece is worth and utilize the value in used equipment to help fund your next project or improve your department's bottom line, Hutton says. He adds that many companies, particularly smaller

ones, will purchase refurbished equipment to cut down on costs, so there is always a need for used storage devices and other equipment.

However, before you sell your used storage devices, it's important to look into potential compliance issues related to HIPAA, Sarbox, PCI, or other standards, according to Hutton. If you are clear of compliance obstacles, you should also have your vendor, and other vendors if possible, give you a price quote for how much your used storage assets are worth before you commit. Maximizing the ROI for used equipment is a great way to lower your overall IT budget and put away money for future purchases.

✔ Prepare Ahead Of Time

After you choose a vendor, there are a few things you'll need to prepare and submit before the disposal process can begin. Norm Hutton, head of sales and acquisitions at WeBuyUsedTape.net (www.webuyusedtape.net), says you should compile a list of items and identify brands and part numbers, which will give the disposal company enough information to provide a quick turnaround on a quote. After submitting your equipment list and getting a quote, Hutton says that most vendors will handle shipping, eradication, and proper reuse, recycling, or disposal. Solid preparation before the process will lead to faster and better results.

✓ Understand Your Role

In addition to submitting the equipment list and getting the process started, you should know what your responsibilities are during the disposal process. "The client's role is to specify their data destruction policy and audit to ensure it is being executed properly by a service company or their own in-house talent," says Joe Mount, director of business development at Tabernus (www.tabernus.com). He adds that clients can also specify that the work be done on-premises or ensure that equipment is being sent via secure carrier to the disposal facility. A good disposal company will be transparent in its process and shipment tracking so you'll always know the location of your equipment.

BONUS TIPS:

✓ Know Your Industry Regulations

You should be aware of environmental standards and your industry's compliances and regulations to make sure you are following them throughout the disposal process. Joe Mount, director of business development at Tabernus (www.tabernus.com), says that specific standards, such as U.S. Department of Defense 5220.22M or NIST 800-88, should be mentioned ahead of time so the disposal vendor can provide the highest level of compliance.

✓ Track The Disposal From Beginning To End

Disposal companies should be able to provide a detailed description of the disposal itself and let you track your equipment throughout the eradication process. Norm Hutton, head of sales and acquisitions at WeBuyUsedTape.net (www.webuyused tape.net), says it's crucial to ask questions whenever they arise to ensure you are getting exactly what you expect from your chosen vendor.

HOW TO

Maximize Server Utilization & Effectiveness

Ensure You're Tapping The Potential Of Your Servers & Assigning Proper Workloads

As CHARLES KING, Pund-IT principal analyst, puts it, "IT assets, including servers, are investments, and it's simply good business to ensure that your investments are performing as well as is technically and humanly possible."

For servers, this means maximizing how they are used and ensuring your hardware can fully support the enterprise's application and workload requirements. Ultimately, this can also mean determining if consolidation and/or virtualization are viable options. Fortunately, when compared to four or five years ago, this process is fairly easy now, King says. "There are hundreds or even thousands of success stories for use cases of virtually every kind," he says. The following addresses how IT and data center managers can gain insight

in terms of server utilization and decide if changes are in order.

Why It Pays To Know

During non-peak periods when servers aren't needed, they still draw an average of 70% of their maximum electrical load, says Clemens Pfeiffer, Power Assure CTO and founder (888/225-1575; www.powerassure.com). Even the newest, most efficient servers vary electrical demand between 40% and 100%, he says, while actual application load can vary from 5% to 95%, mostly remaining around 10%. "Thus servers in data centers waste a substantial amount of energy through idle power consumption. Poor server utilization is one of the biggest sources of waste in most data centers.

Therefore, it's highly beneficial for data center operators to track and manage IT and facilities resource utilization in order to maximize operational and capital efficiency and reduce costs," he says.

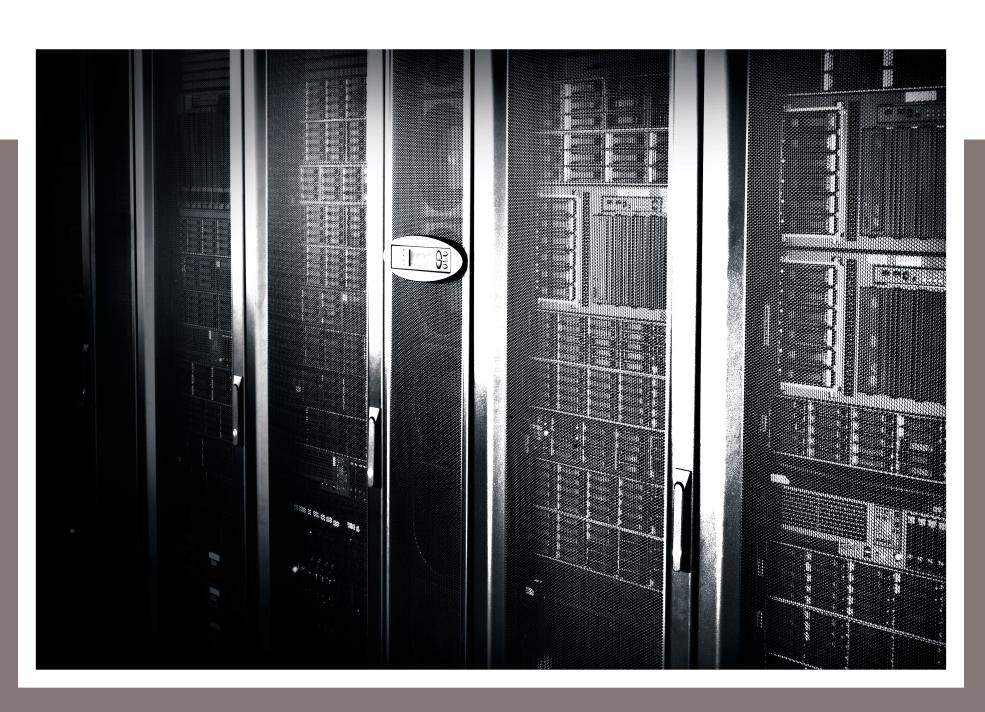
According to Aberdeen Group Senior Research Analyst Richard Csaplar, virtualization is the best action an IT department can take in regard to the enterprise's servers. For data centers that are several years old, he says, the management and consolidation benefits realized can be great. Beyond eliminating old, out-of-warranty servers, engaging in virtualization can also increase application uptime through such features as live application migration and high availability, he says.

Unlike the "old model" in which there was generally one application per server

Key Points

- Poor server utilization is a major source of waste in most data centers.
- Servers should be viewed as an investment that the enterprise maximizes but matches to suitable workloads.
- Data centers that are several years old can benefit greatly from the management and consolidation benefits afforded by virtualizing servers.

and not many specialized applications, Csaplar says, most business processes today are automated and "there are supporting apps for everything—hence server sprawl." Virtualization, he says, enables loading as



many applications on one server as the server can handle, with CPU and memory determining the application limit. Getting 30% more performance from each server means "30% fewer servers required, each with a service contract, power consumption, cooling requirements, space, management, etc.," Csaplar says.

Recognize When Change Makes Sense

Csaplar says there are numerous management-focused applications designed to monitor and track CPU utilization that are sophisticated enough to automatically move virtualized applications from a server that's overused to a server that has excess capacity. This ability, he says, "ensures that a greedy app doesn't endanger the performance of the others that

share the server." There are costs related to making server changes, including software licensing and potential training to use such management tools, Csaplar says. He recommends getting training on new products such as these, as their tools can be powerful and feature-laden. "If done correctly, these could be paid for quickly with the savings of reducing the number of servers in your infrastructure," he says.

Pfeiffer says as data center managers explore the need to integrate monitoring and automation software systems for data center management in order to realize increased utilization, they'll need to know the size and nature of the server population across the enterprise (make, model, and configuration of all IT equipment); the specifications of the current virtualized

environment and plans for future virtualization; and the type of applications running on the servers. "Data center managers need to also make considerations for increased energy efficiency, compliance, and sustainability," he says.

Avoid Potential Obstacles

Pund-IT's King says that beyond the time spent between order and delivery, completing deployment, testing requirements prior to bringing a new system into production, and additional typical occurrences, "issues related to consolidation and/or virtualization can also drop a fly into the ointment." He says avoiding such issues is one of the reasons that planning is so important, including in terms of apprising yourself of the challenges

that are ahead, avoiding dumb mistakes, and preparing for the problems bound to occur anyway.

Pfeiffer says dynamically managing data centers in real-time, including managing server utilization, requires much greater integration of the IT load and the monitoring and management systems than was the case in the past. "Currently, the industry standard is to first measure data centers in terms of reliability and availability but not utilization nor energy efficiency, therefore operators could very well push back on dynamic capacity adjustments as not validated, not reliable, etc.," Pfeiffer says. "However, this obstacle will be overcome as the market matures and issues of trust are resolved with proven reference sites."

Top Tips

- ✓ Continually monitor performance. Charles King, Pund-IT principal analyst, says it's important for IT and data center managers to remember that servers' "mileage will vary," especially if IT consolidates multiple workloads or applications on virtualized servers. "Maximizing system performance is an ongoing process; you don't just set it and forget it," he says. "Any number of factors can push things out of whack."
- Implement in stages. Clemens Pfeiffer, Power Assure CTO and founder (888/225-1575; www.powerassure.com), says IT can introduce automation and optimization solutions to the data center in a staged fashion in order to facilitate support from all stakeholders and for effective risk management. "Operators can first implement automated procedures for non-critical applications, learn how to manage excess capacity, and adapt operating procedures to a more flexible configuration. The savings will be in excess of 50% of the IT power consumption," he says.
- Consider DCIM. Pfeiffer says costs associated with DCIM solutions usually aren't prohibitive and are justifiable from an ROI perspective, particularly in terms of automation solutions that improve server utilization. Savings here aren't trivial, he says, with various entities observing that the cost to power a typical server over its useful life can now exceed the original capital expenditure, and the cost to power one rack of servers can top \$50,000. "So, reducing the power consumed while servers are 'idle' or clusters are lightly utilized holds the potential to deliver significant savings while continuing to satisfy application performance objectives. Based on our experience, the ROI for any implementation is less than six months and paid directly from power savings."

Action Plan

- Assess the current serverrelated assets (hardware, software, etc.)
- Define the enterprise's server-related requirements and expectations
- Consult companies that have implemented technologies similar to those you're eying
- Set a budget with an acceptable ROI
- Consult vendors about products (consolidation, virtualization, etc.) you're considering
- Set up a test environment for trial
- Deploy the server into a production environment

Get Started

When implementing server changes, potential products, tools, and resources required can include consulting with vendors and VARs for insight on system and software performance and appropriate solutions. "It basically comes down to system hardware and related software (OS and application), virtualization software (if applicable), system/data center management software, and any related services," says Charles King, Pund-IT principal analyst. Data centers might require staff training; maintenance contracts; system and network management tools; monitoring and management solutions; and sensors, meters, and intelligent power strips.



BUYING TIPS:

Data Center Furniture



FURNITURE IS THE REAL BACKBONE of your data center. That's why purchasing furniture that matches your needs is essential. Here's what to keep in mind.

✓ Know Your Company

The best place to start is with your company needs. "Some companies need conference room furniture for secure and private consultations and others, such as network centers, might utilize server cabinets or colocation cabinets and racks," says Susan Wynne, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions net) The furniture you choose depends on the services your company provides.

✓ Find Out What Users Need

You'll spend significant time making sure you get the right furniture for your equipment. But don't forget the needs of users, too, says Nichole Stutzman, creative manager at Anthro Technology Furniture (www.anthro.com). She suggests asking several questions:

Will the workstation be shared by multiple users? If so, an adjustable-height desk is ideal.

How many monitors will the person use? While two monitors is the norm, many people use several monitors. Pay attention to how much weight the desk safely holds.

What is the user's work style preference? Does she prefer to work sitting down,

standing up, or a little bit of both? A sit/stand desk provides the ability to change positions.

Is mobility a factor? Large sturdy casters are best when it comes time to rearrange your office space.

Is storage available? Make sure there's room for peripheral items such as tablets, mini-touch devices, and extra cords.

✓ Focus On The Future

Be sure to look for key features, such as height-adjustment for chairs or cable management systems for racks. If you invest in modular furniture with swappable pieces, you'll have room for future growth, Wynne says.

Stutzman agrees, adding that you need to keep in mind the system you're buying today will most likely be designed quite differently in just a few years. Therefore purchase furniture that adapts easily.

In addition, Wynne says, choose furniture that will have a long lifespan. "You have to know that your current furniture will still be available in six or 12 months should you wish to duplicate or expand."

✓ Make Sure You Use Your Space Efficiently

You can save money on furniture without sacrificing quality by making sure you are using space efficiently. One way to do this is to go vertical rather than horizontal, possibly by investing in pieces of furniture that are

wall-mountable. "Office and lab space is at a premium," says Kristen Speranza-Diamond, vice president at Hergo (888/222-7270; www.hergo.com). "It's beneficial to go vertical and make the best use of square footage."

Speranza-Diamond says that most necessary pieces of furniture and equipment for data centers are becoming less expensive, "so everyone is upgrading and making the transition to go compact." Manufacturers are putting more advanced technology into smaller packages, which will help you put more equipment into each piece of furniture.

✓ Research Available Vendors

A solid data center furniture vendor will have a long track record of providing high-quality products and services. That ensures you can view it as a partner and work with the company for years to come. "You want a vendor that you can invest in for the future," says Eli Hertz, CEO and president of Hergo. "You don't want to deal with a company that will only be around for a one-time purchase."

Also, be sure to research all of your available options. "Look for a reputable company with knowledgeable sales staff and one with short lead times," Wynne says. She also recommends spending more money upfront on quality products from a long-standing vendor. "The initial investment may be more than you wanted to spend, [but] the furniture will stand the test of time."

KEY TERMS

Adjustable height.

Refers to components users can raise or lower for a better individual fit. Some higherend furniture can be adjusted electronically.

Cable management.

Built-in grommets, channels, or other features to manage cables and wiring.

Modular.

Furniture components that are interchangeable or can be easily modified.

BUYERS' CHECKLIST

- Seek out quality. Although looking for deals can help companies on a tight budget, sacrificing quality as a result can end up costing companies more in the long term, especially if buying from vendors that don't offer lifetime warranties on furniture.
- Know the delivery terms. Before buying furniture, determine if the delivery includes bringing it inside the facility, requires a lift gate or loading dock, and includes assembly or puts the responsibility on you or a third-party installer.
- ✓ Go modular when possible. Buying components that are interchangeable lets you modify the setup to meet changing needs, including downsizing or expanding space. Increasingly, individual furniture units can be mixed and matched and layout configurations easily altered.
- ✓ Build vertically. Purchase components that support building vertically for better space efficiency.

Data Center Cleaning Services

A CLEAN DATA CENTER IS CRUCIAL to maintain the performance of your physical infrastructure and the productivity of your workforce, but you can't rely solely on your janitorial staff to get the job done. Here's what to look for when hiring a data center cleaning service.

✓ Check For A Service Provider's Experience & Reputation

It's important that you don't rush into choosing a data center cleaning service, because there are multiple factors to consider that may make one firm fit your needs better than another. Not every data center is created equal, and many data centers have unique cleaning needs that not all cleaning services can address.

You should not only research what cleaning firms offer, but also look at their reputation and guarantees. You must make sure the provider has years of training in cleaning data center environments, including floors, ceilings, cases, internal components, and much more. In addition, cleaning companies should follow ISO 14644 standards, have experience cleaning ISO class 8 environments, and know how to address airborne contamination and particulate migration.

Also find out exactly what services a cleaning firm offers and what kind of quality you can expect to help narrow down your list of choices and help you make an informed decision. The cleaning service should also be able to provide a detailed list of what it cleans and how thorough it will be

✓ Understand Your Costs

Cost for cleaning varies depending on what a provider offers as well as its reputation. But don't let price fool you. A lot of factors go into the overall price of a cleaning service, and you should make sure you get exactly what you're paying for.

Be sure to look at what is being cleaned for the price you pay and the level of cleaning being performed. There may be specific situations, such as after construction or in the wake of a disaster, where you will need more in-depth cleaning services than on an annual floor cleaning. One type of cleaning may take more time than another, which could affect the overall pricing of the service, as well.

✓ Know What Needs To Be Cleaned

Some parts of your data center will need to be cleaned annually, while others will require quarterly or biannual cleanings. But it's a fairly safe bet that, at some point, everything in your data center will need to be cleaned. Create a cleaning schedule for the building itself as well as the equipment. And stick to the plan.

Make sure your cleaning schedule covers all access floors and floor panels, walls, ceilings, light fixtures, server racks, UPS

units, panels, and more. The best cleaning firms have practices in place that will leave no stone unturned.

✓ Set Clean Policies

Between cleanings, institute policies that limit the access employees have to certain areas of the data center as well as what they can bring into the room itself. If you can get your employees to treat the data center as a sterile environment and decrease the amount of foreign contaminants, it will make the cleaning crew's job easier and potentially lower your costs.

BUYERS' CHECKLIST

- ✓ Get a detailed scope of work.
- ✓ Require that employees be background-checked and drug-screened.
- Periodically check the work in progress.
- ✓ Limit what types of liquids and/or chemicals are allowed in the data center.

KEY TERMS

Airborne contamination.

Gaseous and particulate contamination that can lead to equipment failure; often gauged by particulate sampling.

ISO 14644-1.

An international standard for clean rooms and controlled environments.

Particulate migration.

The movement of contaminants from one sector or piece of equipment to another, often as a result of the contaminant changing form as it's crushed and spread.

Plenum.

An enclosed space (often beneath floors or in ceilings) used for HVAC, cabling, etc.



Data Center Infrastructure Management

only when a failure occurs," Wurtz says.

"These automation capabilities alone save millions in both cost and CO₂ emissions, making the investment made into the DCIM solution highly lucrative."

DATA CENTER MANAGERS are eyeing DCIM (data center infrastructure management) solutions for the numerous benefits they can afford by providing a holistic view of data center and facilities infrastructures. Here are some of the key elements to consider when purchasing a DCIM solution.

✓ Know What DCIM Can Do

DCIM solutions enable IT to view realtime power and temperature usage data on a granular level and provide monitoring, management, automation, optimization, and capacity and budget planning capabilities, all of which lead to the streamlining of operations and improving energy consumption and overall efficiency. DCIM solutions can replace spreadsheets, paper records, CAD drawings, and similar tools traditionally used to track assets. Instead, enterprises gain realtime, in-depth views into physical and IT assets and can use the related data to develop what-if scenarios for capacity planning.

Paul Goodison, CEO of Cormant (www .cormant.com), points out that DCIM solutions enable synchronization of various aspects of data center, IT, and facilities management into one trusted solution, which makes adopting new processes straightforward and helps reduce cost, rework, and tension within and between facilities and IT staff.

✓ Find The Right Product

"The centerpiece of a good DCIM system is one that can integrate seamlessly with other systems, for example an asset management system, so that the operator avoids duplicate functionality," says Brad Wurtz, president and CEO of Power Assure (888/225-1575; www.powerassure.com).

Along with that, Wurtz says, a DCIM solution needs to be scalable to account for growth and be able to compare performance of multiple data centers. Also look for the ability to merge data from multiple sources onto a single pane of glass, pull data from the systems themselves or from other databases, and perform what-if analyses.

✓ Look For Automation

Automation should be a key feature in the DCIM solution you purchase, Wurtz says. Such automation should provide the ability to adjust capacity on-the-fly, he says, using only the computing (and therefore power) needed to satisfy demands.

"Automation also enables operators to respond to outages much more quickly, shift load from one data center to another dynamically based on events or even power pricing, or improve their real-time failover capabilities so that they can keep their backup site powered down, bringing it online

Seek An Easy Migration

Power

700

600

500

Rather than recreating the wheel, seek out a DCIM solution that supports easily migrating existing data to the new system, says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions .net). For example, if you're maintaining

multiple spreadsheets, CAD drawings, and other diagrams, he says, "migrating that information into the DCIM solution easily will be a lifesaver."

Administration

The solution should allow managers to start small and work up to added levels of sophistication in phases, he says, adding that "Flexibility can breed complexity, and while a full-featured DCIM solution can seem complicated, getting started doesn't have to be." A modular solution that enables initially buying what's needed and layering in additional features gradually is a nice benefit.

BUYERS' CHECKLIST

- ✔ Plan for the future. A DCIM solution should support capacity and optimization planning, offering tools that help "determine future requirements for power, cooling, floor space, rack space, and contingency planning," says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).
- ✓ Don't settle for estimations. Some DCIM tools rely on estimations of power use based on average-use calculations," says Brad Wurtz, president and CEO of Power Assure (888/225-1575; www.powerassure.com). "This leads to inaccurate data and capacity metrics, thus potentially jeopardizing operational safety and efficiency in the data center," he says. To maximize the performance of the data center while adhering to safe thresholds, he says, Insist on accurate data collection in real-time directly from IT and facilities equipment.
- ✓ Verify. Solutions with network-query options for communicating with networked infrastructure provide a level of verification against imported data, but audited records are still required, says Paul Goodison, CEO of Cormant (www.cormant.com).

KEY TERMS

Corporate Average Data center Efficiency (CADE) and Power to Performance Effectiveness (PPE).

Two rating systems, created by McKinsey and Gartner, that go beyond power usage effectiveness (PUE) and account for IT energy efficiency. Both systems are designed to help IT managers address low server utilization, which is the biggest source of waste in data centers today.

Point solutions.

Many DCIM vendors offer only one or two DCIM components, or points, rather than an entire suite of DCIM tools.

BUYING TIPS: KVIVS



THERE'S LITTLE DOUBT that KVMs offer plenty of options. Brett Femrite, Rackmount Solutions director of business development (866/207-6631; www.rack mountsolutions.net), says models include simple desktop options that control a handful of computers up to enterprise-level, IP-based KVMs with integrated matrix switching that let multiple users simultaneously access different devices.

✔ Pick A Knowledgeable Vendor

Most people purchasing KVMs are familiar with KVM switching technology, but they are not so well versed in the available offerings, says Jeff Clark, president of Lindy USA (888/865-4639; www.lindy-usa.com).

If you don't have time learn about all of the offerings, carefully consider the aptitude of the vendor partner you are working with, Clark says, and be transparent about your needs and future growth plans. "A good KVM vendor can help place the right system in your hands, but in order to do that, you must take the time to include this vendor in the initial planning stages," he says.

✓ Consider Security

Buying a KVM with secure IP remote user access is essential for reducing manpower and negating the need for onsite operation by enabling administrators to gain BIOS-level access to servers, says Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com).

Femrite says you need to consider automatic time out, which disconnects users

after a specified period of inactivity. A priority feature for data centers with multiple users accessing the enterprise's devices is permissions-based access rights, which grants specific users access to only the devices and administration levels they need.

✓ Factor In Compatibility

Be sure to account for compatibility, Femrite says. Determine the number of devices you want to connect, hardware devices you'll connect to it (mouse, keyboard, monitor), and the connection types (USB, PS/2) you need. Compatibility with the monitor you'll connect the KVM to (DVI or VGA) is also essential.

✓ Check For Devices & Users

KVMs have a limited amount of servers and devices they can directly control. Will Beene, rack specialist and technical account manager at Rack Solutions (888/903-7225; www.racksolutions.com), says you need to know how many users can be supported both locally and remotely. KVMs are offered in a variety of port densities, so you should be able to find one that perfectly fits your needs.

Yim says you can reduce KVM hardware expenditure and simplify management with a KVM that offers simultaneous multiuser access from different locations on devices connected to the same KVM switch.

✓ Determine The Distance

Determine the maximum distance you need to connect devices to the KVM. "If further than approximately 25 feet, you should opt for a CAT5 cable vs. the standard KVM cable kit,"

Femrite says. If the servers are too far away for the cabling to reach, you may need to invest in a KVM extender that converts the KVM signals and allows them to travel over a greater distance.

Yim adds that new CAT6 KVMs can minimize distance-related problems as a CAT6 cable with interface dongle can support up to 130 feet without signal weakness.

You could also invest in KVM over IP, which lets staff control servers from anywhere using an Internet connection. The KVM over IP switch will also feature an encryption protocol that will help secure the data you send over the network.

"KVM over IP allows the servers to be further away from the KVM switch; however, Service Access Modules (SAMs) are required," Beene says. "You have to weigh the cost vs. the benefits. In large organizations with distributed systems, KVM over IP is an easy method of administration and management."

For companies without a large number of distributed devices to control, Femrite says, consider built-in remote access for connecting the KVM to the network and managing devices from anywhere.

✓ Plan For The Future

Be sure to factor in future additions or purchase a KVM that can daisy chain or cascade to avoid having stranded assets you outgrow, Femrite says. Pay special attention to the cost, benefits, and expandability of the KVM switch.

Clark says you also need to consider the flexibility of the system you are buying. "How do units chain together and how does chaining affect performance (video bandwidth, etc)?"

KEY TERMS

Cascading.

Connecting KVM switches together in a chain by attaching one switch to the computer port of another.

Converter.

An add-on device that converts the KVM signal from one platform, such as Windows, to another, such as Apple.

Emulation.

A switch's ability to imitate a signal so that the PC thinks that it's directly connected to the KVM.

KVM extender.

Converts the KVM signal to travel over a greater distance than it would have previously, eliminating the need to control the servers from the server room.

KVM sharing.

Enables multiple users to access the same KVM.

BUYERS' CHECKLIST

Anthony Yim, general manager of Austin Hughes Solutions Inc. (510/794-2888; www.austin-hughes.com) offers this list of features to look for:

- ✓ Do you need traditional DB-15 cables or CAT6 cables with an interface dongle?
- ✓ Does the KVM support secure IP remote access?
- ✓ Do you need a single local console or multiple consoles with IP remote access features?
- ✓ Will the KVM be standalone or integrated with an LCD keyboard drawer?
- ✓ Will you have a single user or concurrent users?
- Does it have multiplatform connectivity so you can mix legacy hardware platforms between DVI, USB, PS2, and Sun solutions?



Data Center Cooling

FOR DATA CENTER PROFESSIONALS, cooling is as vital a concern as storage capacity and security: Data centers run more efficiently and reliably with the proper temperature, and uptime is everything. Having the right cooling equipment is essential.

✓ Make Sure You Need More Cooling

Without having a firm understanding of your data center, airflow, and cooling, you could be purchasing cooling equipment when you don't need it, says Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com).

"Over a decade of load and capacity measurements in computer rooms continues to show that, on average, computer rooms have an installed cooling capacity that is 250% of the IT load," Strong says.

"This vast over-implementation of cooling is often the result of poor airflow management and a lack of understanding of loads and capacities." Typically, 120% of load is more than adequate to account for redundancy. To see if problems in the computer room are a result of capacity limits or distribution challenges, calculate the Cooling Capacity Factor, or CCF, Strong says. It is the ratio of total installed nameplate capacity to critical load. This ratio should be about 1.2, or 120%.

✓ Know How Much Power It Takes

Before you make changes to your existing cooling equipment or purchase new equipment, you should first measure how much power is being used to cool your data center and whether this is efficient enough to adequately cool the room. You should get a baseline measurement of the temperature inside of the data center and then move on to the equipment housed inside racks and cabinets.

There are many ways to do this, but Jim Magallanes, engineering director at Computer Room Uptime (877/908-8043; www.cruptime.com), recommends installing an energy monitor to determine the exact amount of energy the data center is using.

✓ Decide Between Open Or Closed Loop

Open-loop cooling systems utilize a liquid coolant such as water that is exposed to air and the environment. They tend to have a lower initial cost but also require more frequent maintenance and water treatment, and they suffer from reduced efficiency compared to closed-loop systems. A closed-loop system uses an air- and environment-isolated liquid coolant. Closed-loop systems tend to have a

higher initial cost but require less maintenance and provide better cooling efficiency.

✓ Maximize Your PUE

The cooling infrastructure of a data center typically consumes half of the total energy, Strong says, offering plenty of opportunity to improve PUE. For chilled water systems, Strong says, variable speed fans can produce substantial savings and provide flexibility as loads in the computer room vary. For DX systems, free cooling coils are important to consider, particularly if the site has in place or plans to implement partial or full containment. "As these best practices are implemented, the temperature set points of the

cooling units can be raised without adversely affecting the intake conditions of the IT equipment," he says.

✔ Don't Forget Airflow Management

"A great deal of money is thrown away on cold air that just doesn't reach the equipment," says Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). If you can add filler panels and other add-ons to your cabinets and racks, then you can direct cool air to where it's needed. This is a relatively inexpensive solution to cooling issues, and it could result in long-term savings.

BUYERS' CHECKLIST

- ✓ How many BTUs do you need to keep your equipment at the appropriate temperature?
- ✓ Do you really need the additional cooling equipment?
- ✓ Do you need a closed- or open-loop system?
- ✓ Where will the cooling equipment be located?
- ✓ How much of a concern is noise output?

KEY TERMS

British Thermal Units (BTU).

Used to measure the amount of energy required to heat a liquid such as water. A single BTU represents enough energy to raise the temperature of one pound of water by one degree Fahrenheit at a constant pressure of one atmosphere. In the context of cooling equipment, BTUs are listed as a given rating per hour.

Cooling Capacity Factor (CCF).

The ratio of total installed nameplate capacity to critical load. This ratio should be about 1.2, or 120%.

Power Usage Effectiveness (PUE).

A technique used to help enterprises measure how much of their total data center energy usage is going toward IT and computing equipment.

PDUs



PDUs HAVE EVOLVED into integral components of a modern power distribution infrastructure, delivering correct voltage and current to multiple outlets. Here are some things to watch for when purchasing your next PDU.

✓ Understand The PDU Options

"There are generally three types of PDUs: basic, metered, and switched," says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www .rackmountsolutions.net). A basic PDU lacks monitoring and remote administration capabilities. A metered PDU has everything a basic PDU has but adds a meter that lets users visually track amperage and management software that lets users monitor the aggregate current being drawn on each PDU. Switched PDUs support everything on a metered PDU and add local and remote control capabilities on a per-outlet level. Redundancy is also important, Femrite says. A dual-circuit PDU offers added fault tolerance with two power inputs.

Jim Fink, consultant at Upsite (888/982-7800; www.upsite.com), says a feature-rich PDU can let you know when load on any branch circuit exceeds threshold values that you define or when a breaker trips. Monitoring can also include power quality information and transformer temperature alarms.

✓ Know The Power Available

One mistake PDU buyers make is not specifying the power available at the rack. "If you know what power is available at the rack, you are well on your way to correctly specifying the rack PDU," says Greg More, product marketing manager for the PDU business at Raritan (800/724-8090; www.raritan.com).

The power available at the rack is largely defined by the outlets on the whips, More says. For example, if the outlets on the whips are NEMA L15-30R (L = locking, 15 = three-phase 208V Delta, R = receptacle), then the PDU will support 208V outlets on the PDU. If the outlets on the whips are NEMA L21-30R (21 = three phase 208V wye), then the PDU can support both 120V and 208V outlets.

✓ Determine The Power Required

The National Electrical Code requires circuits be loaded to no more than 80% of the circuit breaker protecting that circuit, More says. Most racks have redundant power, meaning two PDUs per rack, but make sure you split the load. Using a NEMA L6-30R (208V) whip example, More says, this circuit would be protected by a 30A circuit breaker at the remote power panel, which would trip at about 30A. To meet the 80% requirement, the

PDU could only be loaded to 24A. The total load could be a maximum of 5kW (24A x 208V). In the case of redundant PDUs, More says, split the load in half (2.5kW per PDU) so that if one power feed fails, the remaining PDU will be able to handle the total load and remain at or under the 80% requirement.

✓ Account For Growth

Make sure the PDU can handle your needs both now and into the future. "If you don't precisely match up the PDU with your power consumption needs, taking into account anticipated growth/increases, you can wind up having a breaker tripped," Femrite says.

But, Fink says, be careful not to oversize the PDU. "Consider serving new growth zones in the data center with new PDUs when the time comes rather than from grossly oversized PDUs purchased now." Also, if you need to add branch circuits to existing PDUs without a shutdown, some PDUs allow safe addition of branch circuits while the PDU remains energized, he says.

BUYERS' CHECKLIST

The following tips were provided by Julie Brown, marketing manager at Server Technology (www.servertech.com).

- ✓ Know the different types of PDUs. What type of PDU do you need for your data center? Choose from basic, intelligent, metered, or switched.
- ✓ Know your power needs, or consult an expert. Make sure you're buying the right PDU for the job. You want to make sure that the PDU you buy
 matches up with your power consumption needs. If you don't know what
 your needs are, bring in an expert who can help you determine them.
- ✓ Look for the best quality. You want the best quality you can afford for reliability and performance to power your mission-critical equipment.
- ✓ Service. Make sure you can get tech support and services after the sale.

KEY TERMS

Intelligent PDU.

Any PDU that offers Web-based management, meter power at both the PDU and individual outlet level, and real-time power monitoring.

K Rating.

For PDUs with transformers, this is the transformer's ability to handle harmonics.

Poles.

The number of spaces in a panel that breakers can occupy; 42 poles is common.

Three-phase wye.

This system has a neutral wire that allows the three-phase system to provide a higher voltage (line-to-line, e.g. 208V) while still supporting lower-voltage single-phase (line-to-neutral, e.g. 120V) appliances.

Servers

BUYING A NEW SERVER takes significant prep work. Beyond pinpointing the data center's needs and how the server will meet them, there are budgetary, compatibility, and vendor considerations to address, as well.

✓ Determine What's Important

Charles King, president and principal analyst at Pund-IT, counts CPUs, memory, and I/O as the most critical server features, though their relative importance depends on the application and workload they'll support. Companies running a business-critical database or online transaction program, for example, should eye a higher-end CPU/system than what's needed for general-purpose applications. For virtualization-related use, spend more for extra memory and I/O.

Emre Kulali, director of channel marketing at Power Assure (888/225-1575; www.power assure.com), says that, in addition to the CPU, memory, and I/O, you need to consider form factor (how many U's, expandability, accessibility), the hard drive and interface, and manufacturer brand (what type of documentation, service, and warranty are available).

Kulali says you also need to know the server's power capabilities, including whether you can upgrade or add additional power supplies. "In order to maximize the transaction capacity of a data center, the size, power consumption, and compute capacity of servers need to match the facility. You want to maximize the transaction capacity, max out the available power, and ideally use all available space in the data center."

✓ Watch For Trends

There are energy-efficient and highly scalable compute platforms available, Kulali says. Data center managers need to watch these trends carefully and determine the compute systems that would respond best to business needs as well as reduce energy costs and improve compute efficiency, he says.

"As data center managers are going through hardware refresh cycles with an eye on these new trends, they need to make informed decisions by requesting reference information and measurements as it relates to power consumption, efficiency, and performance of servers beyond vendor specifications," he says.

✓ Know The Impact Of Virtualization & Consolidation

John Sloan, lead analyst for virtualization and consolidation at Info-Tech



Research Group, says that unlike the distributed processing world in which servers had a one-to-one relationship with applications, consolidation and virtualization are becoming the norm today.

In this space, Sloan says it's important to know how a new server will fit into a consolidated stack that includes servers, networks, and storage. Unlike distributed models, "in a consolidated infrastructure, the server is a unit of hard capacity (processing and memory) that's combined with networks and storage in a resource pool that's partitioned up into virtual entities." Increasingly, he says, enterprises aren't buying servers, but blocks of capacity. What differentiates current offerings "is how the interconnects are managed and how the whole thing is managed as one resource pool," he says. Typically, blade servers are the form factor for consolidated offerings, he says.

✓ Consider Your Budget

Before you get started with a server upgrade or replacement, be sure to carefully plan your budget. Costs associated with a server upgrade can be staggering, says Charles Jansen, technical support manager at Aberdeen LLC (800/500-9526; www aberdeeninc.com). Possible expenditures include those related to equipment, software licensing, labor, telco and power company services, facility improvements, vendor support, and downtime. Additional costs related to supporting a new platform can include those for power, network cabling, cooling, rack space, and management personnel, he says.

Sloan says, "In any infrastructure purchase, the upfront capital acquisition cost is just part of the deal. Three- to five-year total costs should be calculated, including maintenance and facilities costs."

BUYERS' CHECKLIST

- ✓ Match the application and workload the server will support to the CPU, memory, I/O, storage, and other components they'll require.
- Recognize that virtualization, consolidation, and cloud computing are trending areas where servers are concerned.
- Ensure the vendor satisfies all questions concerning support, compatibility, performance, and other issues.

KEY TERMS

Configuration.

Refers to a server's makeup in terms of components (CPU, memory, storage, etc.), OS, and the like.

Total cost of ownership (TCO).

Includes the server's initial acquisition cost but also associated maintenance, facilities, cabling, and other expenses covering three to five years.

Tape Media: Buying Used & Disposing Of Old

✓ Get Past The Fear Of Buying Used Tape Media

Tape manufacturers work hard to convince their customers not to buy used tape, but used tape vendors say that those warnings are nothing more than fear mongering designed to increase manufacturers' sales. Most tapes are designed to withstand thousands of mounts in a tape drive. However, many tapes are written to just once and then sit on a shelf for years before companies are ready to dispose of them. These cartridges have a lot of useful life left.

✓ Always Follow Good Tape-Handling Procedures

Certified used tape can be used for the same applications as new tape, and it doesn't require any special handling procedures. However, you should treat it with the same care that you would treat new media.

Tape manufacturers and resellers recommend that you store tapes vertically and never take apart the cartridges or touch the media with your bare fingers. In addition, you should avoid dropping the tapes and keep them away from magnetic devices, including monitors, speakers, electrical motors, and power supplies. You also shouldn't let your tapes get too cold or too hot, and when you move them from one place to another, you should wait 24 hours to let them adjust to the climate conditions before mounting the tapes.

✓ Evaluate Your Data Destruction Options

When getting rid of old tape media, you'll typically choose between an onsite or offsite service. With an onsite data destruction service, you'll remove the need to deal with a chain of custody documentation, which can become a legal burden and add complexity to the job. For data centers that store a lot of sensitive data and want to physically destroy the data, you'll enjoy the peace of mind that comes with watching the destruction take place. With an onsite data destruction service, the vendor will provide all the equipment necessary to handle your storage equipment.

Some data destruction services offer more powerful shredders at their facilities than mobile shredder services can offer. So if you want absolute destruction that's beyond any type of recovery, choose an offsite data destruction service.

A number of offsite data destruction services also double as a reprocessing center that can

remarket the parts, so you can get some return value for your used equipment.

✔ Partner With A Data Destruction Service

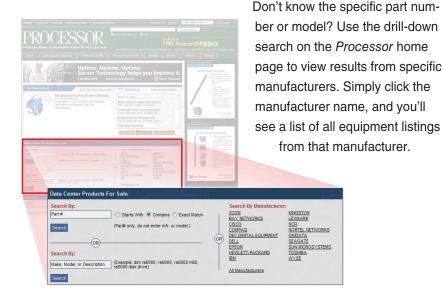
Qualified IT asset disposal vendors will assist your company and take over the responsibility for certification and compliance. Some of the current data compliance standards include those from the DoD (Department of Defense), NSA (National Security Agency), and NIST (National Institute of Standards and Technology). Most data destruction services also provide you with nondisclosure, confidentiality agreements so you can ensure that your data will be securely dealt with.

Another benefit of a data destruction service is that it can provide you with a variety of options for handling your various types of storage media. For example, let's say that you want to shred a bunch of old tape drives, CDs, and mobile phones, but you want to merely wipe the data off old hard drives so that they can be reused in other parts of your data center or donated to worthy causes. Most data destruction services offer you a combination of degaussing and shredding services in both onsite and offsite variations.

USE PROCESSOR.COM TO FIND DATA CENTER EQUIPMENT

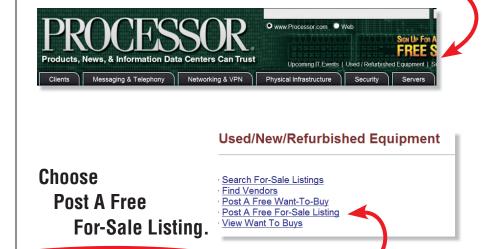
Looking for help pinpointing the products you need, from vendors you can trust? Finding the equipment you need is easy with *Processor*'s online Data Center Products For Sale Database.

From *Processor*'s home page (www.processor.com), you can search for a specific part number, make, model, or description. Enter the information in the appropriate box and click Search. You'll see a list of available equipment. If you don't see the particular piece you're looking for, scroll to the bottom of the search results page to conduct a more detailed search. There, you can search by part number, model, price, location, and more.



Do you have excess equipment? Post it for sale on Processor.com!

On the Processor.com home page, click Used/Refurbished Equipment.



Follow the on-screen directions from there!

Network With Your Peers

At These IT Training & Association Meetings Across The United States BADGE PAGE 1

NOVEMBER

AITP Washington, D.C.

Nov. 8

Alfio's La Trattorio Restaurant

4515 Willard Ave.

Chevy Chase, Md.

www.aitpdc.org

San Diego **Technology Symposium**

Nov. 8

5775 Kearny Villa Road

San Diego, Calif.

www.scalematrix.com/sdtech

AITP Pittsburgh

Nov. 12

5 to 8 p.m.

Silvioni's Restaurant

2125 Babcock Blvd.

Pittsburgh, Pa.

www.aitp-pgh.org

AITP Northeastern Wisconsin

Nov. 14

Holiday Inn-Appleton

150 S. Nicolet Road

Appleton, Wis.

new.aitp.org

SONORAN

AITP Cornhusker

Nov. 15

5:30 p.m.

Lincoln, Neb.

www.aitpcornhusker.org

ISSA **Baltimore**

Nov. 28

Concurrent Technologies Corp.

8530 Corridor Road

Savage, Md.

www.issa-balt.org

DECEMBER

Android DevCon IV

Dec. 7

San Francisco, Calif.

www.andevcon.com

AITP Pittsburgh

Dec. 10, 5 to 8 p.m.

Silvioni's Restaurant

2125 Babcock Blvd.

Pittsburgh, Pa.

www.aitp-pgh.org

AITP Washington, D.C.

Dec. 13

Alfio's La Trattorio Restaurant

4515 Willard Ave.

Chevy Chase, Md.

www.aitpdc.org

ISSA Baltimore

Dec. 19

Concurrent Technologies Corp.

8530 Corridor Road

Savage, Md.

www.issa-balt.org

AITP Cornhusker

Dec. 20

5:30 p.m.

Lincoln, Neb.

LLAN

ESTACA

www.aitpcornhusker.org

Do you have an event you'd like to see listed? Send an email to feedback@processor.com.

Processor **Solutions Directory**

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

PHYSICAL INFRASTRUCTURE



Mainline Computer Products has been in business since 1986 and has one of the nation's largest selections of LAN furniture, command centers, and server cabinets. We can serve companies of all sizes, including educational institutions and city, state, and federal government agencies. In addition to offering data center equipment, we can assist in the planning, design, construction, and design/ build process.

Products Sold:

- Command consoles
- · Server cabinets
- Computer room equipment
 Technical furniture
- UPS and PDU systems
- · Access flooring

(800) 686-5312 I www.mainlinecomputer.com

PHYSICAL INFRASTRUCTURE



LINDY USA specializes in cables, adapters, electronics and accessories for computer, networking and audio video applications. Since 1932 Lindy has supplied high quality interconnects to customers in commercial, telecom and residential markets. What sets us apart is our complete dedication to innovation, performance and reliability. Our cabling products are truly outstanding.

Products Sold:

• Networking Products • Audio / Video • KVM • Sharing, Converting, Extending • USB and FireWire • Input Devices • Add-On Cards • Hardware and Security • Power • Cabless • Adapters and much more!

(888)-865-4639 | www.lindy-usa.com/

PHYSICAL INFRASTRUCTURE



Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Penn.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 I www.sensaphone.com

PHYSICAL INFRASTRUCTURE



BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- · Power control, distribution, management, and metering
- · Power transfer switches
- · Console management and remote site management

(800) 523-2702 | www.baytech.net

PHYSICAL INFRASTRUCTURE



PDUsDirect.com is a Master Distributor of select Server Technology PDUs for server and networked environments. PDUs Direct's basic, metered, and switched Rack PDUs provide local and remote power management, power monitoring, and environmental monitoring. We pride ourselves in offering industrial-grade quality products at the lowest prices, with the fastest shipping (most orders shipped within 24 hours) and simplest purchase process. We are the Power Behind the Business.

Products Sold:

A complete line of metered and basic PDUs, and 20A switched PDUs.

(888) 751-7387 | pdusdirect.com

PHYSICAL INFRASTRUCTURE



Power Assure helps enterprises, government agencies, and managed service providers gain the insight, knowledge, and automated control necessary to improve data center capacity, service levels, and power usage. The company counts ABB, Dell, IBM, Raritan, and VMware as partners.

Products Sold:

Dynamic Power Management & Optimization software that replaces "always-on" data center operations with a more efficient "on-demand" model aimed at cutting power consumption by 50 to 60%.

(408) 980-1900 I www.powerassure.com

PHYSICAL INFRASTRUCTURE

PDU:: Cables

PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 I www.pducables.com

PHYSICAL INFRASTRUCTURE

Page 45



Future Facilities Incorporated aims to help enterprises improve and manage their mission-critical data centers. Its multifaceted software suite called 6SigmaDC supplies comprehensive 3D modeling of every aspect of data center layout, cooling, power, and even weight. Partners include Intel, Cisco, Dell, and HP.

Products Sold:

6SigmaDC data center modeling and simulation software

(408) 436-7701 | www.futurefacilities.com

PHYSICAL INFRASTRUCTURE



The Mestex division of Mestek is comprised of seven company brand names: Applied Air, LJ Wing, Aztec, Alton, Temprite, Koldwave, and Sierra. Mestex is involved in emerging technology and product research focused on using energy and water more efficiently, including ways to improve data center efficiency by using outside air, evaporative cooling, and optimized DDC control schemes.

Products Sold:

- · Mechanical and evaporative cooling products
- Heating products
- · Outside air tempering products
- · Packaged evaporative cooling solutions for missioncritical applications

(214) 819-5262 I www.mestex.com

PHYSICAL INFRASTRUCTURE



RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

Products Sold:

Computer server racks, cabinets, shelves, and mounting products.

(888) 903-7225 | www.racksolutions.com

PHYSICAL INFRASTRUCTURE



Upsite, the "Pioneering Company in Airflow Management Solutions" was founded by Ken Brill, who established the Uptime Institute, a think tank dedicated to identifying efficiencies within data centers. Upsite's LOK Family of energyefficient solutions are engineered to optimize the data center. This sets Upsite apart. Upsite solutions empower data center managers to leverage cost savings for data center optimization (i.e. releasing stranded capacity, increasing server density, improving system reliability & reducing energy consumption).

Products Sold:

- KoldLok HotLok
- AisleLok
- EnergyLok

(505) 798-0200 or (888) 982-7800 | I www.upsite.com

PHYSICAL INFRASTRUCTURE



Temperature@lert is a leading provider of low-cost, highperformance temperature monitoring products designed to provide early warning of temperature changes before it's too late. The company's goal is to deliver products that can eliminate your worries about system malfunctions or product damage due to temperatures. The Boston, Mass.,based company has sold more than 10,000 products to customers in 40 countries.

Products Sold:

A full line of temperature monitoring products, including the Temperature@lert USB Edition, WiFi Edition, and Cellular Edition

(866) 524-3540 $\,$ I $\,$ www.temperaturealert.com

PHYSICAL INFRASTRUCTURE



CTI was founded by Methode Electronics in 1997 and during the past 13 years has provided data centers with innovative solutions. CTI has recently become the cornerstone of Methode's Data Solutions Group, joining forces with the Methode dataMate and OPTOKON divisions in supporting the data center and communication industries. In addition, our highly qualified professional services team can engineer and install the best solution to fit your needs.

Products Sold:

Fiber and copper cabling solutions; Smart DACs; cabinets, patch panels; asset tracking; biometric access control; optical test equipment; harsh environment network equipment

(888) 446-9175 I www.methode.com/data

PHYSICAL INFRASTRUCTURE



LANSTAR is a worldwide supplier and manufacturer of durable and innovative Technical furniture. All LANSTAR systems are expertly engineered to be interchangeable providing unparalleled flexibility and value. Our Professional staff, with a consultative sales approach, has been designing and providing solutions that are space effective and increase efficiency in the network environment. Let LANSTAR customize your system to fit virtually any need.

Products sold:

- Computer cabinets
- USB port blockers · Raised flooring
- · Rackmount cabinets
- PDU's
- KVM switching

LAN racks

AV swithces

(800) 474-3947 I www.lanstar.com

NETWORKING & VPN



Metric Systems Corporation® designs and manufactures broadband wireless networking equipment, and end-to-end solutions for government and industry. We've been in the business of manufacturing and integrating reliable industrialgrade wireless networking systems for over 25 years. Our networks are deployed around the world protecting and supporting people and machines. Our specialty is working with your unique requirements and existing infrastructure to provide a networking solution that fits your requirements, schedule, and budget.

Products Sold:

Rhino Box® Environmentally Controlled Equipment Shelters and SAFARI™ Wireless Controllers and Radio Systems.

(800) 549-7421 I www.metricsystems.com

PHYSICAL INFRASTRUCTURE



Know more. Manage smarter.

Founded in 1985, Raritan has become a leading provider of power and energy management, DCIM and KVM solutions. Our products are in use at more than 50,000 locations worldwide, including eBay, Cisco, Intel, NASA, and the United States Post Office, giving IT departments the tools they need to increase power management efficiency, better manage data center changes, improve data center productivity and enhance branch office operations.

Products Sold:

- Intelligent Rack Power Distribution Units
- Energy Management Software
- · Data Center Infrastructure Management
- · KVM and Remote Access Management

(732) 764-8886 I www.raritan.com

PHYSICAL INFRASTRUCTURE



Critical Power Exchange buys and sells mission-critical backup power and cooling system equipment typically used in computer rooms, datacenters and other industrial applications. Founded in 1993, CPE is your single point of contact for disposal or acquisition of reliable datacenter, environmental and mission-critical power equipment.

Products Sold:

- Generators
- Raised Access Flooring
- Transformers
- Switchgear • Fire Suppression
- UPS Systems Power Distribution Units
- Air Conditioners

(877) 630-7520 I www.criticalpower.com

PHYSICAL INFRASTRUCTURE



Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its highquality products and superior customer service.

Products Sold:

- Racks
- Computer desks
- Enclosures/cabinets
- · Cable management
- Motorized workstations
- · Power management
- Flat-panel arms
 - (888) 222-7270 | www.hergo.com

Networking & VPN



Alvaco Networks specializes in load balancing technology. Our expertize allows us to meet the needs of any network, from basic to highly sophisticated. We have a proven track record for resolving network and balancing applications for small, medium, and large size companies.

Products Sold:

- Load Balancer Systems
- VPN Aggregators
- Cell Technology Access Routers
- Firewall/Broadband

(407) 574-2017 | www.alvaco.com

PHYSICAL INFRASTRUCTURE



Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, highperformance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

Products Sold:

- · Wallmount and server racks and cabinets, including sound proof, air conditioned, and large cable bundle
- · Desktop/tabletop portable racks
- · Shockmount shipping cases
- Bulk cable

(866) 207-6631 | www.rackmountsolutions.net

PHYSICAL INFRASTRUCTURE



Founded in 1995, Austin Hughes Electronics Ltd is a design and manufacturing group that offers a broad range of solutions based around 19 inch rack mount technology. With a wealth of experience Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handels
- InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- · Environmental Sensors

(510) 794-2888 | www.Austin-Hughes.com

PHYSICAL INFRASTRUCTURE



AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS

(888) 220-6700 I www.AVTECH.com

STORAGE



Founded in 1991, Aberdeen is a leading manufacturer of servers and storage options for IT departments. Aberdeen products can be found in many of today's high-tech corporations, as well as government agencies, hospitals, and universities. Aberdeen prides itself on unmatched customer service, open and honest communications, long-term commitments to working relationships, and personal and professional integrity.

Products Sold:

- Components/parts
- Servers (barebones, custom, rackmount, and storage)
- Storage (DAS, iSCSI SAN, JBOD, NAS, SAN)

(800) 500-9526 | www.aberdeeninc.com

SERVERS

CHENBRO

Chenbro is a leader in enclosure solutions, selling its products primarily to system integrators and OEM and channel partners. The company's extensive research and development efforts help it to keep its competitive edge and maintain market leadership, with special focus on thermal, EMI, and acoustic solutions. Taiwan-based Chenbro has offices in the United States, UK, The Netherlands, and China.

Products Sold:

• A comprehensive line of PC chassis, server/workstation chassis, rackmount chassis, and HDD enclosures.

(909) 947-3200 I www.chenbro.com



IT Hardware Repair offers industry leading network, VoIP and telecom equipment repair services. We offer a one 1 year limited warranty on ALL products we repair. IT Hardware Repair brings complete transparency to the network computing hardware repair service industry. Extend the life of your equipment with Cisco router repair, Cisco switch repair, Juniper network equipment, Bizfon Telecom hardware and most any other IT hardware you wish to extend the life of.

Products Sold:

• IT Hardware Repair Services

(650) 561-8160 I www.ithardwarerepair.com

EQUIPMENT DEALER



In 1987, Pegasus Computer Marketing started providing mainframe products to the end-user market. What began as a sales-only organization soon adapted to offer in-house repair and refurbishment. During the past 10 years, Pegasus has focused primarily on the point-of-sale and barcode industries, buying, selling, and providing service contracts for anywhere from a few scanners to hundreds.

Products Sold:

We buy, sell, and service:

- Point-Of-Sale Equipment and POS/PC Flat Panels
- Wired and Wireless Barcode Hardware · Kronos Time Clocks and Accessories

(800) 856-2111 | www.pegasuscomputer.net

SERVERS

SUPERMICR • 8

Supermicro® (NASDAQ: SMCI), the leading innovator in highperformance, high-efficiency server technology ,is a premier provider of advanced server Building Block Solutions® for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green®" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- · Network switches · GPU servers
- Motherboards Storage solutions Embedded
- Chassis · Blade servers

(408) 503-8000 | www.supermicro.com



Data Specialties Inc. (DSI) is a nationwide data center design-build firm with over 20 years experience. Office locations include Los Angeles, Orange County, Phoenix, Sacramento, San Diego and St. Louis, with licensing in over 20 additional states. Call 1-800-454-5164 or visit www.WeBuildDataCenters.com for more information.

We Build Data Centers Nationwide

Data Center Services:

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800-454-5164 I wwww.WeBuildDataCenters.com



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CLIENTS



The Smart Choice for Text Retrieval® since 1991, dtSearch® offers over 21 years of experience in parsing and searching data. The dtSearch product line includes enterprise and developer text search products, meeting some of the largest-capacity text retrieval needs in the world. dtSearch's website offers hundreds of developer case studies and press reviews. The company has distributors worldwide, including coverage in six continents.

Products Licensed:

Text retrieval products, including:

- · Desktop with Spider
- · Web with Spider
- · Network with Spider
- Engine for Win & .NET
- Publish (for portable media)
 Engine for Linux

(800) IT-FINDS I www.dtsearch.com

EQUIPMENT DEALER



NeweggBusiness is the business-to-business division of Newegg Inc., specializing in providing IT and office products. NeweggBusiness was formed in 2009 as an initiative to satisfy the growing needs of businesses, government, healthcare organizations, and educational institutions. Businesses and organizations can take advantage of features such as Net 30 Day terms, volume discounts, lowcost bulk shipping, and live inventory status.

Products Sold:

More than 60,000 office and computer products, including servers, desktops, notebooks, tablets, printers, scanners, monitors, network switches and routers, memory, motherboards, and software.

(888) 978-8988 I www.neweggbusiness.com





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Market & Technology News

Advice, Strategy & Tips From Experts

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